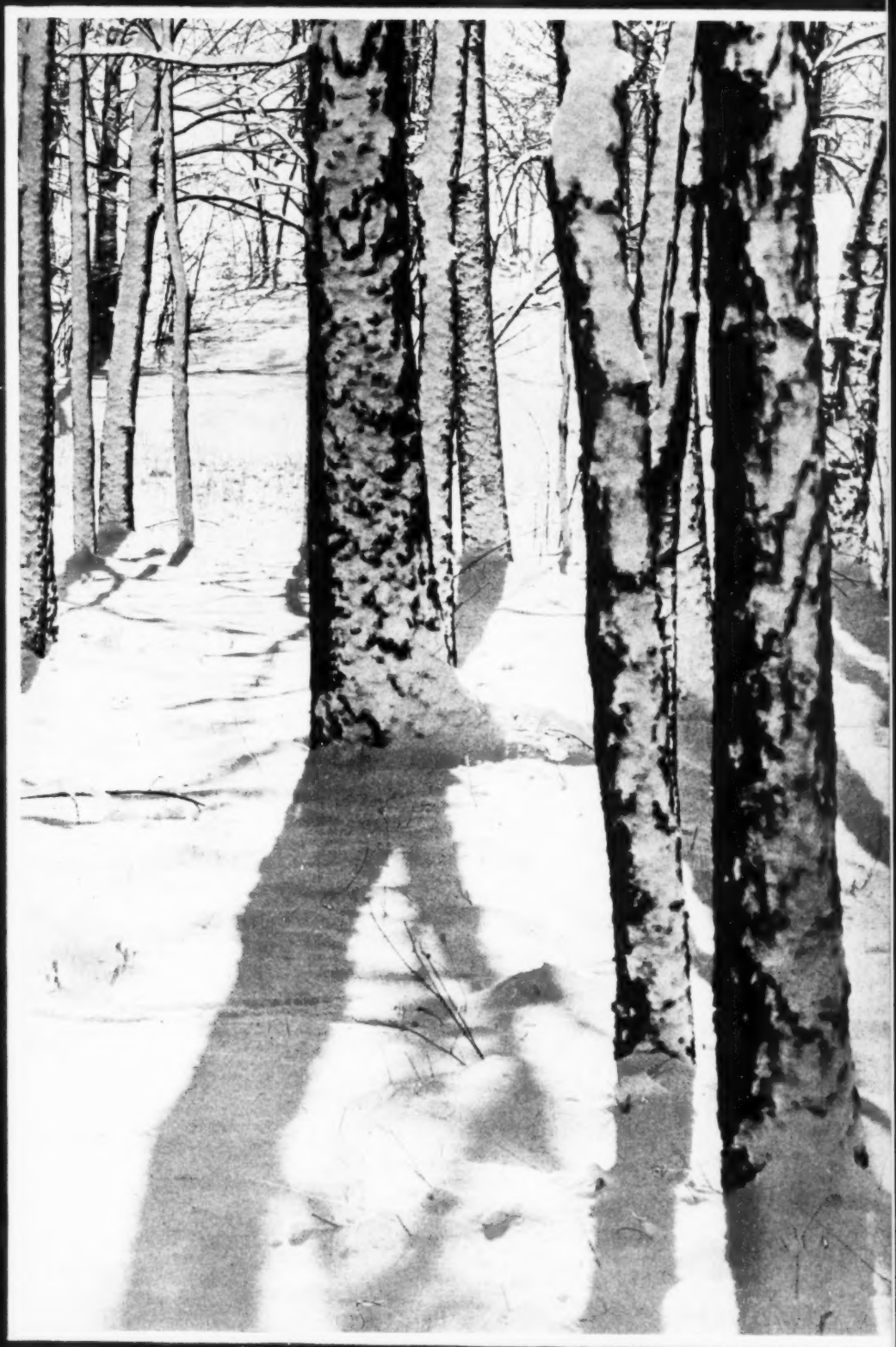
AMERICAN FORESTS



FEBRUARY 1943 35 CENTS A COPY

Telephone wire coming up

Here's a bomber-gunner hurrying to load his 50-calibre gun. . . .

In peace, a lot of that copper would have gone into new telephone lines. Now it's needed for shooting and winning the war.

That's why we can't build new lines right now. That's why we're saying —"Please don't place Long Distance calls to war-busy centers unless it's absolutely necessary."

Thanks for all your help and we hope you will keep remembering.

BELL TELEPHONE SYSTEM

WAR CALLS COME FIRST

COPYRIGHT ARMY AIR FORCES AID SOCIETY

AMERICAN FORESTS

VOLUME 49 FEBRUARY, 1943 NUMBER 2

Editor
OVID BUTLER

Associate Editors
LILIAN CROMELIN ERLE KAUFFMAN

CONTENTS

Page

THE EDITOR'S LOG 52

THE BLACK WARRIOR GOES TO WAR 55
By Charles Elliott

BLUE GROUSE 58
By Leonard Wing

OIL FROM THE AMAZON 60
By Frank Henius

INDIGO TO DUCKS 63
By Sigmund Sameth

TIES FOR TOTAL WAR 67
By Gordon D. Marckworth

FIGHT FOR THE CACTUS 70
By Nancy Lunsford

THE SANTA LUCIA FIR 72
By Maunsell Van Rensselaer

THE ELMS AND THE WAR 75
By E. G. Brewer

EDITORIALS 77
A War Break—Beware!
Conservation in the Peace

JOHN BARTRAM AND HIS TREES 78
By Harry Stanton Tillotson

YOUR SHADE TREES—Some Unusual Varieties 80
By L. E. Manning

TREE TRAILS 82
A Report on American Big Trees

LIVE OAK—(*Quercus virginiana*, Miller) Tree Series 84
By G. H. Collingwood

FORESTRY IN CONGRESS 88

NEW PUBLICATIONS 90

The Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. All manuscripts should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles. Notice of change of address for *American Forests* should be received by the tenth of the month preceding issue. Entered as second-class matter at the Post-Office at Washington, D. C., under the Act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional entry at Baltimore, Md., December 29, 1931.

Copyright, 1943, by The American Forestry Association.

American Forests

Published monthly by

THE AMERICAN FORESTRY ASSOCIATION

919 Seventeenth Street
Washington, D. C.

The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

35c A COPY
$4.00 A YEAR

THE AMERICAN FORESTRY ASSOCIATION

919 SEVENTEENTH STREET
WASHINGTON, D. C.

OFFICERS

President
W. S. ROSECRANS

Executive Secretary
OVID BUTLER

Treasurer
GEORGE O. VASS

Business Manager
FRED E. HORNADAY

Vice-Presidents

Alexander P. Anderson—Minnesota, chemist and inventor.
George Alexander Ball—Indiana, Ball Brothers Foundation.
Morris Belknap—Kentucky, artist and conservationist.
Thornhill Broome — Illinois, Izaak Walton League of America.
W. H. Cowles — Washington, "The Spokesman Review."
Aubrey Drury—California, Save-the-Redwoods League.
Thomas M. Edison—New Jersey, engineer and industrialist.
Mrs. T. M. Francis—Alabama, Chairman of Conservation, General Federation of Women's Clubs.
Mrs. Luis J. Francke—New York, Chairman of Conservation, The Garden Club of America.
Quintin T. Hardtner — Louisiana, Urania Lumber Company.
Edmund Hayes—Oregon, Keep Oregon Green Association.
Augustus S. Houghton—New York, New York State Reforestation Commission.
D. S. Jeffers—Idaho, School of Forestry, University of Idaho.
Elis Olsson—Virginia, The Chesapeake Corporation.
H. M. Seaman—Texas, Southern Pine Association.
Henry D. Sharpe—Rhode Island, manufacturer.
Miss Olive Simes—Massachusetts.
Herbert L. Stoddard—Florida, author and wildlife expert.
Gordon Strong—Maryland.
Mrs. Henry Alvah Strong—District of Columbia, Hattie M. Strong Foundation.

Board of Directors

Goodwin Beach, 1944 — Connecticut, Connecticut Forest and Park Association.
Bryce Browning, 1947—Ohio, Secretary, Muskingum Watershed Conservancy District.
Frederick P. Champ, 1946 — Utah, President, Mortgage Bankers Association of America.
Samuel T. Dana, 1947 — Michigan, School of Forestry and Conservation, University of Michigan.
Karl T. Frederick, 1946—New York, New York State Conservation Council.
William B. Greeley, 1943—Washington, West Coast Lumbermen's Association.
L. P. Livingston, 1944—Delaware, American Society of Agricultural Engineers.
James G. K. McClure, 1945—North Carolina, President, Farmers Federation.
Frank E. Mullen, 1946—New York, National Broadcasting Company.
Randolph G. Pack, 1944—New York, President, Charles Lathrop Pack Forestry Foundation.
Colin G. Spencer, 1943—North Carolina, President, North Carolina Forestry Association.
Wilbur K. Thomas, 1943 — Pennsylvania, President, Pennsylvania Forestry Association.
John W. Watzek, Jr., 1945—Illinois, National Lumber Manufacturers Association.
William P. Wharton, 1947—Massachusetts, President, National Parks Association.
C. P. Wilber, 1945—New Jersey, Director of Conservation of New Jersey.

The Forest Exchange

Better Wood Utilization

SIR: In sending in my ballot for next year, I want to subscribe particularly to point No. 2 (promotion of research in the field of forest products) of the 1943 Wartime Program of The American Forestry Association. This point covers what has long been a weak point in programs for forestry and conservation, a point which has received much less emphasis than, especially, points Nos. 1 and 3, and some other items not specifically mentioned in your program. The impetus of war has worked a minor revolution in the utilization of wood. Why do we have to wait for war to bring on simple new developments in wood utilization? Why can't the ingenuity now being shown in that field remain in harness?

You might be interested to know that I get more enjoyment out of AMERICAN FORESTS than any other publication in the conservation and related fields.—*A. W. Greeley*, Billings, Montana.

New York's Largest Tree

SIR: I notice in your December number a foreword on one of the notable trees of New York State. Without detracting at all from the account of the balsam poplar near Geneva, I venture to call your attention to the balm of Gilead tree near my old family homestead at Newburgh. This tree is in the village of Balmville, part of the township of Newburgh, and as I estimate it, is about 200 years old. Various citizens, past and present, of Newburgh can tell you about it, and I suggest that you consult Senator Thomas C. Desmond who is especially interested in trees. He has an arboretum with many interesting specimens. Our Balmville tree is, I think, larger than the Geneva tree and equally famous historically.

The story goes that Matthew Vassar of Poughkeepsie, who became a wealthy citizen and founded the first university for women, slept under this tree in 1808 when, as a boy of twelve or thereabouts, he had run away from a tanner's shop where he had been apprenticed against his will.

While George Washington and his friend LaFayette have never been mentioned as associated with this balm of Gilead, it is hardly conceivable that they did not know it, for General Washington was quartered at Newburgh at the end of the Revolutionary War when peace terms were being debated. It is known that LaFayette was his guest there, and in the headquarters building a furnished guest-room has always been known as the "LaFayette Room."

There are without doubt older trees than our balm of Gilead — such as old white oaks — but I venture the statement that there is no larger tree in New York State.—*Frederic A. Delano*, Washington, D. C.

Tree Seeds for China

SIR: You will be interested to know that seven pounds of tree seeds for experimental planting in deforested areas of northwest China have been donated by the United States Department of Agriculture Forest Service to Indusco, participating agency of United China Relief. The seeds, the coniferous variety, were collected in Missoula, Montana, since that region most closely resembles the climatic conditions in the affected section of China. They are being flown to China by air express.

Seeds from this particular part of the country were decided upon after consultation with the Honorable Gifford Pinchot, member of Indusco's Advisory Board.

It was extremely difficult to find the kind of tree that would withstand the rigors of climate in the affected area of China's Northwest. The area is at an elevation of 5,000 feet, and has blisteringly hot, short summers, cold nights, strong wind during spring and summer, and small rainfall.

Widespread tree-planting for the Northwest is being planned in an effort to halt the existing severe soil erosion, the result of years of indiscriminate tree cutting. The importance of trees in this area was tragically demonstrated in Honan Province when, during the recent flood, everyone was swept away except those who clung to trees planted ten years ago, in a Chinese Government reforestation program.—*United China Relief*, New York.

American Forests Helps

SIR: AMERICAN FORESTS, which is donated to our school by Dr. L. W. Cunningham, has proved of much interest and help in our study of forest conservation, in so much that we have taken as a school project the setting of 500 pine seedlings on our new ten-acre location. We have the full cooperation of the Florida Forest and Park Service and are told that this is the first project of its kind (by a school on school site) in this state.—*C. A. McCully*, Principal, Loretto Elementary School, Jacksonville, Florida.

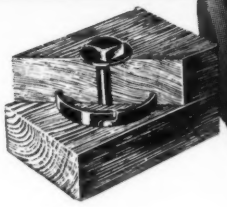
GROWING PLANTS

Selective cutting under scientific woods management has harvested over-age trees and left a healthy, vigorous forest. New seedlings for tomorrow's forest will spring up where sunlight can reach down to the forest floor.

Plants for Industry - Today and Tomorrow

Roof Trusses by Timber Structures, Inc., Portland, Ore.

Engineers, Architects, Designers, Builders in every field of industry now are using engineered timber for heavy duty structures. The TECO Timber Connector System made this possible. You, too, can design in timber with TECO. *Write for our literature today.*



The TECO Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.

Timber ENGINEERING COMPANY

WASHINGTON, D. C. PORTLAND, OREGON

THE EDITOR'S LOG

Citizen Soldier No. 238

In this magazine twenty-four years ago there appeared the lines printed below, written by Citizen Soldier No. 238 of the national draft army of World War I. To the editor's staff the name of this young soldier is not known but the quiet, sacrificial spirit of his words is as timely and as true today as it was in 1918:

"They say, who have come back from Over There, that at night the troubled earth between the lines is carpeted with pain. They say that Death rides whistling in every wind, and that the very mists are charged with awful torment. They say that of all things spent, and squandered there, young human life is held least dear.

"It is not the pleasantest prospect for those of us who yet can feel upon our lips the pressure of our mother's goodbye kiss. But, please God, our love of life is not so prized as love of right. In this renaissance of our country's valor, we who will edge the wedge of her assault make calm acceptance of its hazards. For us the steel-swept trench, the stiffening cold —weariness, hardship, worse.

"For you for whom we go, you millions safe at home—what for you? We shall need food. We shall need care. We shall need clothes for our bodies and weapons for our hands. We shall need terribly and without failure supplies and equipment in a stream that is constant and never ending. From you who are our resource and reliance, who are the heart and hope of that humanity for which we smite and strive, must come these things."

Gasogenes for China

In a town out in the middlewest, 1500 gasogene units are being made by an American manufacturer for shipment to China. They are the first contingent of an order that may top 6000 units—all destined to be installed on Chinese trucks which have been grounded by the Japs cutting China's main life line of gasoline. The shift from gasoline to wood gas as a motive power, engineers say, will be simply and quickly accomplished by merely adding the gasogene apparatus to the trucks now waiting for fuel. The 1500 units in course of construction are on the order of the China Defense Corporation and have been placed with the Brooklyn company which is having them made in the middlewest for shipment by midsummer.

This is the second chapter of a rapidly moving story (see November and December issues) of the coming of the gasogene to America. Back of it is a larger and more phenomenal story that reaches around the world. Its full details will not be known until the war is over. It is the story of one country after another faced with gasoline shortages turning to wood as a source of gas for the operation of automobiles and the maintenance of transportation systems.

Under pressure of war, the development and application of gasogene equipment, whereby gas is produced within the automobile itself from wood chips or wood charcoal, has spread like wildfire from one country to another. Since the war started, gasogenes have come into extensive use in Australia, South Africa, Brazil, Switzerland, France, Italy, Germany, Norway, Sweden and other non-gasoline producing countries. The latest estimate is that over 180,000 are operating in Germany and that ninety per cent of Sweden's automotive transportation is now propelled by wood gas. The transportation system of France which went dead after the first German occupation was later saved by the gasogene.

Will gasogenes come into use in this country? Heretofore, gasoline in the United States has been too plentiful and too cheap to encourage the adaptation of wood gas to our automobiles. Now conditions have changed and critical shortage of gasoline and fuel oil, combined with war needs, are pointing to U. S. gasogenes—at least to a limited extent. It is said that the Army has its eye on the gasogene for war use in sections of the country remote from sources of gasoline and also for use in allied countries where the importation of gasoline presents a shipping problem. It is known, too, that Canada is testing out the gasogene for war use in that country. So Americans need not be surprised if some day passenger cars or trucks operating on wood gas are pointed out to them on our own streets and highways.

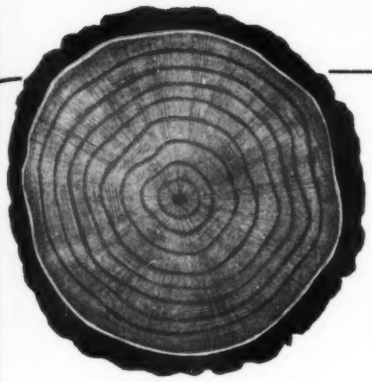
Chief Forester

This entry goes back to 1913. In that year the Editor was a member of the U. S. Forest Service and was located at Ogden, Utah, in a position the duties of which involved general direction of forestry work in some twenty-five national forests in Utah, Wyoming, southern Idaho, and northern Arizona. Exact knowledge of the timber resources of the forests was much lacking at the time and mapping and timber surveys — "timber reconnaissance," the work was called —were being pushed as rapidly as the Forest Service could get the necessary money from Congress.

The work was done by crews made up in part of young foresters. In fact "timber reconnaissance" was considered a sort of apprenticeship for foresters freshly out of eastern forest schools and thirsting for a smell of the western national forests. The work was hard and grueling, usually in rough, back country, but it was toughening and it gave a man the feel of growing timber and the challenge of big mountains to climb.

In the spring of 1913, the Washington office wrote it was sending us six or eight of these diploma foresters. Among the names listed was one Lyle F. Watts, just graduated from the forestry department of Iowa State College. On July 1, young Watts arrived at the Ogden office shyly tiptoeing across the threshold, hat in hand—"Reporting for duty, Sir." He was a tall, lean, blondish boy of a man and in his eyes was a kindly inquiring gleam that lighted up his whole face and made one feel instantly that its source was a kindly, inquiring heart. He had spent all but his last two dollars in getting to Ogden and his appreciation of being grub-staked until his first salary check arrived was as warm as the morning sun that streamed in the east windows.

Young Watts was assigned to a survey project at the headwaters of Hams Fork in the Wyoming National Forest. Having received his instructions, he departed as quietly and as unostentatiously as he had arrived. Shortly afterwards the Editor left the Ogden district and it was many years before he again met Lyle Watts. During the interval, Forester Watts had kept on climbing mountains. From



"timber reconnaissance" he ascended through ranger grades to an assistant forest supervisor, then to forest supervisor. With the same quiet steadiness that marked his "Reporting for duty, Sir," he continued upward to the directorship of a forest research station and on to a regional forester with many forests and millions of acres under his charge.

On January 8, 1943, Forester Watts scaled the highest peak in the government's forest domain—a peak that only five other men in the history of American forestry have reached. On that day he became Chief Forester of the United States Forest Service.

A salute to Chief Forester Watts!

Ugly Ducklings

Mr. Marckworth's article "Ties for Total War," appearing elsewhere in this issue, might fittingly be titled "Ugly Ducklings of the Woods." By no stretch of the imagination can the cross-tie, as it comes tumbling from its forest bunk, be called a thing of beauty. Whether hand-hewn from small trees or roughly sawn by small mills, it is a stodgy, tough looking customer and after it has had its creosote bath at a treating plant, it resembles a commando disguised for a raid into the nether regions.

But what the cross-tie lacks in beauty, it makes up many times over in useful service. It is a land marine of the first order. Probably no forest product carries a tougher or more important responsibility—particularly in these war days. We read in our papers every morning of increasingly critical transportation problems—shortages of engines, freight and passenger cars and steel for rails, but no one mentions or seems to think about the lowly cross-tie upon which the whole rail transportation system rests. Without an adequate supply of cross-ties, steel rails and rolling stock become cold junk.

It needs to be recorded, therefore, that a shortage of cross-ties is in the offing. The unprecedented demands for transportation incident to the war are increasing the wear and tear on road beds and shortening the life of cross-ties as well as of steel rails which they support. Last year the railroads had to call for more ties than for many years. Fortunately, they got them and their supply for 1943, it is said, is fairly well in hand. It is 1944 needs which give serious concern, because ties for 1944 should be coming from the woods now and they are not—at least in adequate numbers. As with so many other essential products, it is mainly a question of shortage of labor in the woods. Hewers of ties are skillful men and great numbers of them have been lured into defense industries.

To say that American ingenuity will develop a substitute is mere wishful thinking. American ingenuity has been at that job for years and has failed to develop anything even resembling the wooden cross-tie that equals it for buoyancy, endurance, and all-round wear and tear service. Ugly duckling of the forest family though it may be, it is the one proven bond that ties our whole rail transportation system to the earth on which it operates, if it is to operate at all.

A One-Tree Forest

Although not generally known, the Aleutian Islands can now boast a national forest! It is not official and it contains only one tree. Nevertheless, it has been marked out and is known—humorously at least—by the soldiers holding the particular island on which it is located against the Japs as the "Aleutian National Forest."

William L. Worden, writing in the *Daily Alaska Empire* about the resources of the islands, reports it as follows: "Trees are lacking. There are several explanations why — but wherever trees have been planted they thrive. On one wind-swept isle troops have planted a single sapling, surrounded it with a tight fence and dubbed it the Aleutian National Forest."

According to Mr. Worden the Aleutians are not just hop, skip and jump islands of barren rocks as many people vision them. It is true that climatically they have a bad temper but back of that they have character—beauty and resources of their own making. As for climate, Mr. Worden says: "The wind blows almost as much as it does in Kansas, the rain is even more constant than in the Pacific Northwest, and the combination brings on a horizontal soaking that is no fun in either the Aleut or English tongues."

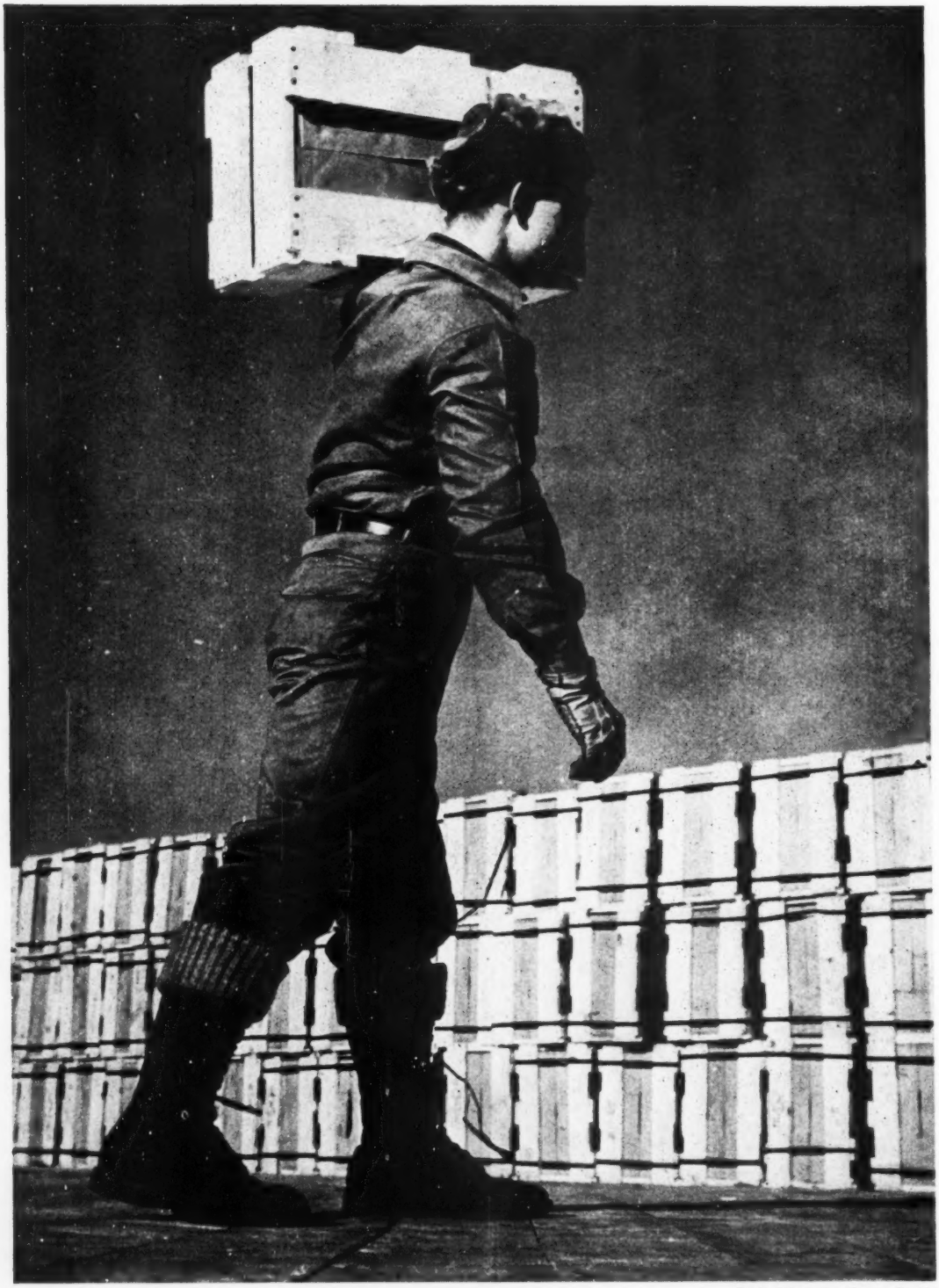
And it is true that most of the islands are topped by fog bound, forbidding peaks "but around the peaks and between the boulders are wild meadows that would make a Missouri mule chortle with delight." In these places the soil is fertile and supports nutritious range and other plants "waist high to a tall man." Game there is—particularly caribou and reindeer which "sport some of the finest horns to be found anywhere," and the islands are unsurpassed for the raising of blue foxes. As for fishing—well, let Mr. Worden tell his own fish story:

"The average Aleutian stream, six feet wide in September, is a frothy, living thing, with hump-back salmon fighting for swimming room or floating drearily down after spawning. Close on the heels of the salmon are myriads of trout getting fat on the salmon eggs. Along the salt-water beaches, seafood is plentiful. The spider crab frequently is six feet from toe to toe, and excellent eating. For codfish and halibut, it is only necessary to drop a hook over the stern of a boat and bait it with almost anything from a red rag to a chunk of bacon fat."

Mr. Worden illustrates Aleutian possibilities by citing the statement of a Japanese journalist who visited Alaska several years ago and was quoted as saying the chain could support 5,000,000 Japanese in comparative comfort.

"And even the American soldiers," he concludes, "who have the wet and nasty job of keeping any part of these 5,000,000 from settling permanently, will admit, homesick as they are, that the foggy peaks, the blues and the greens of the landscape, the spray from the pounding Bering Sea surf, have a strange beauty of their own, probably not equaled elsewhere on the American continent."

Ovid Butler



Public Information, Ottawa, Canada

Wood follows the American soldier to the far corners of the globe,—crating his food, his munitions, practically all of the supplies he must have in his struggle for freedom. For this,—for his ships, barracks, aircraft and hundreds of other uses, he looks to the Black Warrior Forest and other American timberlands, both public and private

THE BLACK WARRIOR GOES TO WAR

And the Purpose of One National Forest is Fulfilled

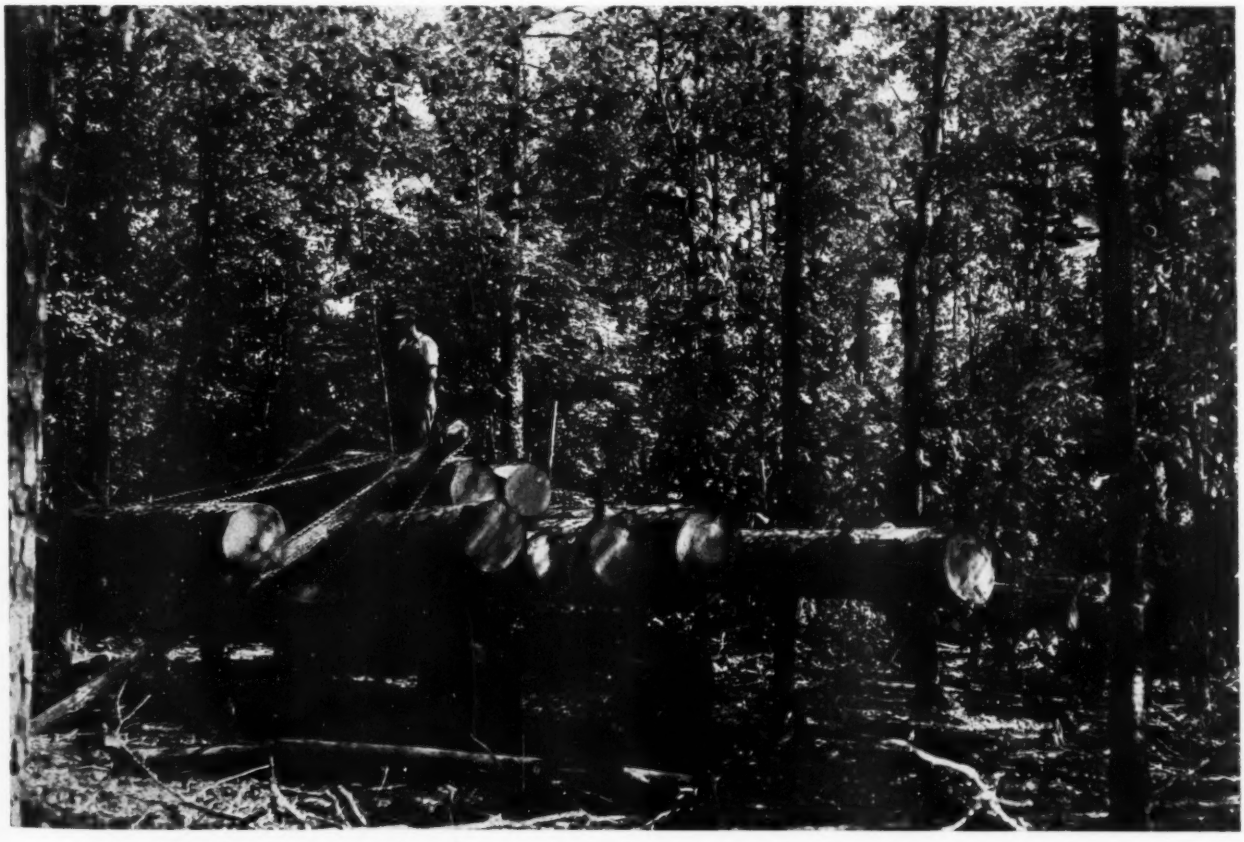
By CHARLES ELLIOTT

Photographs by the Forest Service

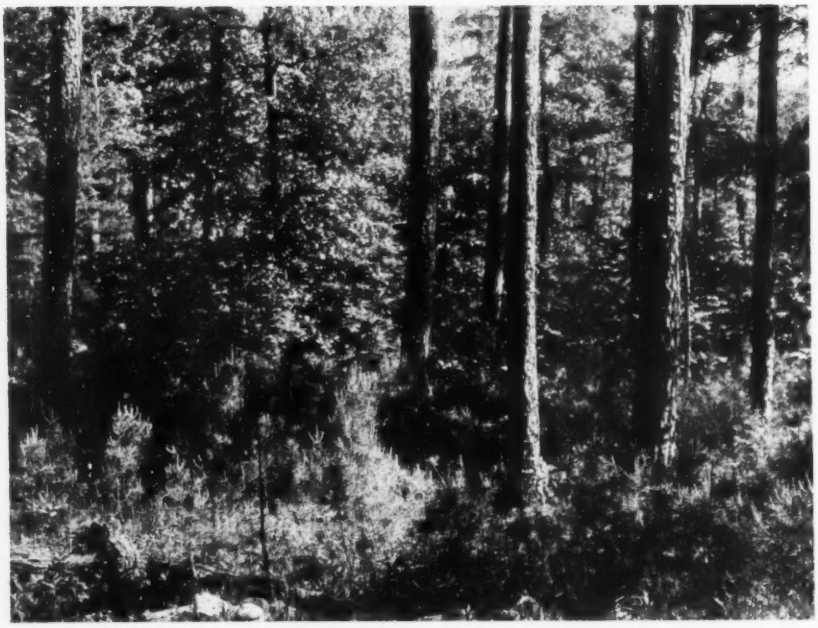
THE nations of the world today are locked in a struggle for survival, on a scale more gigantic than the human race has ever known. Behind that man-made catyclysm of lead and steel and thundering earth, stands an impregnable bulwark of victory, and of a lasting peace and prosperity which will follow victory—the natural resources of soil, and the mined and growing products of that soil. Without oil and steel and wood, without the plastics and the compounds and the alloys, man reverts to an insignificant creature, physically inferior to many of the other creatures.

One of the many factors by which our own land has grown in power and in stature are the national forests. These public timberlands have been called the "backbone of conservation in America." They were created by far-sighted leaders for just such an emergency as now exists. Originally, the legions of acres were set aside as a bank account upon which the nation could draw in times of stress. They have been held in reserve through periods of inflation and depression alike. In times past, the normal flow of timber has been sufficient to meet the needs of the nation, but many of the sources from which our lumber came—back farm woodlots, small forests, second growth conifers and hardwoods—were exhausted during the last great depression before this war. Not exhausted entirely, for the one-lunged sawmills continue to maneuver from patch to patch of woodland, nibbling on crooked trees and poles which had been rejected on previous rounds.

A large percentage of our lumber hauled out of the southern forests now comes from the big companies which have been far-sighted enough to purchase and hold expansive tracts of land, and which are following management plans to harvest those tracts on a sustained yield basis. But even with the vastly increased production, the board feet of hardwood and pine flowing to army camps, air bases, overcrowded war plants and even to foreign lands, has been inadequate to meet the demands



The Black Warrior operations are on a permanent, or sustained yield, basis. By the time merchantable timber is cut, new growth, even greater in volume, will be ready for the mill



For twenty-seven years no part of the forest has been under the ax. Second growth pines and hardwoods are ready for harvest

of hungry war machines. Much of the burden of filling that gap between demand and supply will fall upon the shoulders of our 175,000,000 acre national forest system.

Throughout the South, forest rangers are riding the woods, marking timber to be harvested. Each of the forests is preparing to make contributions to the cause of freedom. In September of 1941, the United States Forest Service sold 120,000,000 board feet of lumber from a single Alabama forest. This was only one of many sales, but behind it lies a story as dramatic and as romantic as the event which brought this national forest into the spotlight of national conservation affairs.

Reminders of a past glory are the abandoned farms found on the Black Warrior. A new prosperity is returning with the forests

Black Warrior is an appropriate title for a forest that has gone to war. This is the original name of the Alabama forest, and is the name by which it still is known throughout the state and the remainder of the South.

The first Black Warrior was a Choctaw Indian—Chief Tuscaloosa. His skin was very dark. He was huge of stature, very courageous and became a legend even during his lifetime. He died in battle with DeSoto's iron-clad cavalcade almost four centuries ago. The northern Alabama forest appropriately bore the name of this proud old Indian chief.

Recently the Congress of the United States passed an act eliminating the picturesque Indian name, in spite of the fact that we have retained all too few of the names handed down to us by the original Americans. Congress renamed this plateau forest the John B. Bankhead National Forest.

We perpetrated about every conceivable crime on the first Americans. We took away their lands, drove them out, despoiled their sacred earth. Now we must banish a stalwart old Indian Chief and replace him with a democrat. Even though the writer may stand alone in his opinion, he believes the friends of John B. Bankhead could have honored him in a hundred more fitting ways.

A unique feature of this timber sale is that the forest trees will be cut on a sustained yield basis. According to Assistant Regional Forester Arnold Shaw, of the United States Forest Service, "this is the first long term sale on a national forest in the South for the purpose of sustaining a permanent operation." The sawmill plans to cut year after year around its established site. It will not cut out and move on, leaving a ghost town behind it, as has happened so many times in the history of lumbering in the southern states.

"In September last year," Forester Shaw said, "the Forest Service opened sealed bids from reputable lumber companies for 120,000,000 board feet of lumber on the Black Warrior Forest. Highest bidder was the Grayson Lumber Company, of Birmingham, Alabama. In checking back, we found that the Graysons had been lumbermen for generations. C. H. Grayson, owner of the company, is the scion of a long line of lumbermen. He is an Arkansan by birth, an Alabamian by choice. He has been in the lumber business in Alabama for more than twenty years."

This enormous sale was a long step forward in the South. And it was on a new basis from any the South had ever known. On most of the national forests, where timber sales had been made in the past, there were more than enough local mills to absorb the timber supply. These local mills bought and cut trees

designated by the Forest Service, then set back to feed on a trickle of logs from private lands until the Forest Service made another sale.

Not so the Black Warrior. The terms of the contract call for building a town, a permanent residence for those who will work in the woods and in the mill. The Grayson Lumber Company is erecting a water system and all the other conveniences of a modern city. Because of the demands of war, Grayson is using little new material in his construction program. Most of the equipment he has purchased is second hand and must be reconditioned. Even the band sawmill is a used mill. Oddly enough, it was bought from a cut-out operation in Mississippi.

Why is he so certain of maintaining a permanent town? One reason is because the Black Warrior is ripe for a big sale. For twenty-seven years no part of it has been under the ax. The second growth pines and hardwoods are ready for harvest. There are pockets of huge, virgin trees, too. Before 1915, the timber operations on this plateau had been on a small scale, by second rate operators, who cut every stick of timber a "man could carry on his shoulder." But they did not cut the massive, virgin timbers. The small mills were not equipped to handle those trees and by-passed them in the forest.

There is another reason why Grayson knows his new town will be a permanent community. The terms of his contract say so. This sale contract calls for the cutting of 7,500,000 feet of lumber a year for sixteen years. At the end of that period, the foresters say, the amount of stumpage that the mill will take out can be increased. They claim that at the end of sixteen years, at the present rate of growth, the forest will contain 100,000,000 more board feet of timber than it does at the present time. Even after 120,000,000 feet have been taken out!

Look at the history of the Black Warrior National Forest. In many ways it is repetitious of other sections of the South. It is located where history was made. It lies approximately seventy-five miles northwest of Birmingham, at the very end of the Cumberland Mountain plateau. Typical of the Cumberland chain, the Black Warrior is a high, wooded plateau, a sort of peninsula lying hundreds of feet above the surrounding country. The northern edge of this plateau is limestone, the southern tip eroded sandstone.

With the exception of the pockets of virgin hardwood timber, the forest cover is a scramble of all types of pine and hardwood, most of it mixed. It is one of the few places in the world where longleaf pine marches up from the coastal plain and mingles boughs with the hemlocks of the North.

Saw mills such as this will cut millions of board feet of lumber on the Black Warrior to feed the war machines of the Allies

During the early days of Alabama, this plateau was one of the most densely settled portions of the southland. It was a Shangri-la of vast plantations, of endless cotton fields, of mansions which were a part of the glory that marked the aristocratic old South. But even in that era of prosperity it produced only two crops—cotton and lumber. There was no diversity of products, except for home use.

Back in those days, the plantation owners had never heard of cover crops.

(*Continuing on page* 92)

Under management as a national forest, game is returning to the Black Warrior, famed as the hunting grounds of the Cherokees

BLUE GROUSE

Bird of the High Forests

By LEONARD WING

The male bird struts in all his glory during the mating season—voicing his booming call

THE general biological principle that where lies opportunity for a living, an organism will evolve to use it, is eloquently portrayed in the case of game birds, particularly the grouse. The ruffed grouse uses the hardwood, the fool hen the spruce, but they find the pine and fir forests of the West generally uninhabitable. A huge cousin—about three times as large as the ruffed—has evolved to occupy the pine and fir. It is the blue grouse.

When one comes upon this bird as, with a sudden roar of wings, it crashes through the trees and disappears, the thought occurs that tree limbs mean little to the blue grouse, for it seems not to dodge but to crash through them. Or when toiling up a sharp ridge you may be surprised as it springs up just ahead and dives into a tree far below. At other times it may quietly hop up into a tree from the trail, there to peer down at the interloper with its head characteristically outstretched. There are no set rules of action which the blue grouse observe, although younger birds generally lack wariness and may be indifferent to human presence.

But let the hunter not think that the blue grouse is always an easy target. The lights and shadows of the forest play queer tricks. While thousands of grouse fall victims each year to pot hunters who have only to knock them out of the trees with easy shots, hunting the birds on canyon sides and steep slopes is quite a different story. The grouse often dive down out of range before the hunter can collect his wits. They may roar out of a tree, fly through the forest for a hundred rods, and come again to rest in another. Though every sound from start to finish be audible, the hunter may neither see nor find the birds.

The nest of the Blue Grouse—a depression in the forest floor

Taxonomists insist that there are two species of blue grouse, but the field man is not easily convinced. The slate-blue color of the male has justly earned the name "blue grouse," but the birds have been called—especially in the earlier days—"gray grouse," "pine grouse," or "pine hen." The unsuspicious nature of the young or unmolested birds has even earned for them the name of "fool hen," which is confusing to say the least, because in the mountains lives the Franklin's grouse, a true fool hen. The men who dominate the books use the terms "dusky grouse," "sooty grouse," and other unnatural names, but the people who live with the birds call them "blue grouse."

Westerners call the male blue grouse a "hooter" because of his unusual courtship performance. Like other members of the grouse family, the blue is no songster, but he makes up for this lack by means of inflatable air sacs along each side of his throat. From these comes a note that rolls forth as a deep, resonant "oop! oop! oop! oop! oop!", ventriloquistic in nature, yet reminiscent of the sound of clothes rubbed on a wet washboard. It may come from high in a bull pine or Douglas fir, from the top of a stump or fallen log, or from the ground. There is still another note which forms part of the courtship performance: a single, deep "hoot!" that even at night bursts off a slope like the blast of an air horn.

A short flight inaugurates the display that is the hooting performance. The wings beat rapidly as the bird rises a few feet, turns and glides to the starting point in a fifteen-foot circle. The tail is erected fan-wise; the wings are drawn along the body like the strut of a turkey; the combs above the eyes stand out from the head like yellow splashes; the neck is extended at an angle to the ground; and the enormously distended throat sacs cause the feathers to part in a white rosette on either side of the neck. From the throat now rolls forth the deep hooting, generally in a five-note sequence.

Blue grouse inhabit the region from Alaska and the Yukon southward into California, Arizona and New Mexico. They range from the Pacific to the dry slopes of eastern Wyoming. Throughout this area, they are associated with the conifers, especially the white and Douglas firs, though rarely with the spruces. They are as unlikely to be found far from conifers as sage grouse are from sagebrush.

During the breeding season most of the birds repair to the lower altitudes

where they inhabit the lower slopes, open park-like areas, cutover lands, gulches and draws. Occasionally they use fields adjacent to conifer forests, and they have even used sagebrush borders. Though they may nest at high altitudes throughout the mountains, they do so only in small numbers.

On dry ranges, there seems to be a definite connection between blue grouse and water. They go to water daily when it is available and have even learned to take advantage of irrigation ditches. Thus, shifts in runoff from differences in rainfall or grazing intensity have made many areas unsuitable for breeding because of lack of water for the young. There are thousands of square miles of range where blue grouse were present, even abundant, when open water remained longer in the summer. Whether a spring, gulch, or waterhole dries up in late June or early August spells success or failure for birds on interior, dry ranges.

The brood composition is loose in the blue grouse, probably the loosest of all the members of the grouse family. The brood instinct breaks down early; the young may wander far from the hen, shift from brood to brood, and even shift for themselves when half grown. A progressive gaining of independence marks this break-down rather than the sudden abandonment that often occurs in domestic hens.

The female shoulders the family burden, though the male may stay close during the early part of the season. Occasionally two females accompany a single brood. The broods are rather small.

Reversing the usual winter movement of mountain game, these large grouse migrate to the high altitudes in fall and go down to the lowlands in spring. Dwarf trees offer refuge in bad weather

for the average consists of less than four young.

Though the young grow rapidly, they are not full grown until October, or even later. Hunting seasons, therefore, should not come before this time. The males grow ten per cent faster than the females, but take longer to reach full size. This is because they are approximately one-third larger. They average two and three-quarters pounds, while the females average about two pounds at maturity.

The custom of mobile animals living in the mountains is to move down to sheltered lower valleys in autumn and up to the higher areas when the weather moderates in spring. The blue grouse are rugged individuals and reverse this process. They migrate up the slope to winter in the highlands, and down to the lowlands again when spring comes.

The upward movement starts in midsummer and spreads over a period of two to three months. Most birds are in or near their winter areas in October, though some may linger in the valleys until well into November. Many broods move up early, but others move only after the disbandment. Some even go high above timberline to feed on blueberries and grasshoppers before returning to winter quarters in the timber below.

The winter area is variable. Sometimes the birds winter in lodgepole pine; frequently they use stunted Douglas firs at the ridge tops; or they may use the dwarf white-barked pine at timberline. Probably the bird is able to digest the resins of the needles which, if digestible, would furnish a rich and concentrated source of nutrition comparable to the richness of seeds and nutmeats. Captive grouse will eat many grains, but the coming of sudden cold weather invariably shifts them to needles. Of all the conifers, they prefer the Douglas fir, white firs, and lodgepole pine. Rarely are they found in spruce or hemlock. The blue grouse may get into a dwarf tree at timberline and stay there for days in bad weather, though good

(*Continuing on page 96*)

Home of the Blue Grouse—looking north in the Sinlaheekin Valley of Washington covering spring and winter ranges. Breeding in low elevations, their winter range is above 4,500 feet

OIL FROM THE AMAZON

From the Trees of the Great Amazon Valley May Come the Vegetable Oils for the Western Hemisphere

By FRANK HENIUS

TODAY, no ships bearing cargoes of vegetable oils plow through the dangerous waters of the Pacific. As a result, the two billion or more pounds annually supplied this country from the Far East must be replaced or we will face a shortage in oils essential to war production, as well as to our food habits and health. These oils, the most important of which are of tropical origin, yield war-needed glycerine and drying oils, and are also used in the manufacture of soap and other products. At no time has the United States been self-sufficient in these vital materials, and now, more than ever before, must new fields be explored and developed.

Fortunately, we do not have to look far. A vast storehouse of vegetable oils may be found right here in the Western Hemisphere. It needs only to be tapped. Throughout the great Amazon Valley, from the Brazilian seaboard to the mighty river's headwaters in the Oriente of Ecuador and Peru, there are vast forests of palm and other trees, as well as shrubs and vines, so rich in oil content that there would be no lack of oils and fats were they to be made available. The United States Bureau of Foreign and Domestic Commerce reports that more than half of the 1,250 palm species growing in the Western Hemisphere are found in Brazil. And despite the fact that Brazil's fats-and-oils export trade is more than one-third as large as its important coffee industry, only a few of its palms have been developed commercially.

According to Charles E. Lund of the Bureau of Foreign and Domestic Commerce, who last summer headed a mission of United States vegetable oil technicians to Brazil, that country is the world's greatest untapped source of fats and oils—untapped, that is, for world markets, as local utilization of palm resources has been going on for years.

"Brazilian resources of vegetable oil-bearing raw materials are so tremendous they stagger the imagination," he said. "Billions of babassu palm trees are concentrated in the northern tropical states of Maranhao, Para and Piaui. Conceivably these trees alone could supply the world's entire needs for lauric acid-containing oils of the coconut and palm kernel types."

Even before Pearl Harbor, Brazil had substantially increased shipments to the United States. During 1941, approximately 400,000,000 pounds of the more important oils and oil seeds were exported, almost double the 1940 export figure. That this amount increased again in 1942 is not to be doubted.

Brazil recognizes its opportunity and, with United States collaboration, has inaugurated a large-scale development program. Improvements in rail, water and road transportation are being projected. Irrigation and power dams on a

Bureau of Foreign and Domestic Commerce

Carnauba palms, usually found in light stands, have become so valuable as wax producers that millions of young trees are being planted to achieve density sufficient to warrant cultivation

large scale are under construction. And organizations to deal with quality control of vegetable oils are being set up. The two most pressing problems at the moment are prices high enough to attract labor to these new fields, and shortages of certain machinery essential to any broad program of expansion.

The United States government has already stimulated this program by contracting to purchase the exportable surplus of two of Brazil's most important vegetable oils—babassu and castor. Other contracts will no doubt follow.

The babassu palms, which yield oil well known in soap and perfume industries, and also for lubrication of machinery, are numbered in the billions throughout the lower Amazon Valley. They are particularly abundant in the State of Maranhao, which lies along the seaboard below the great delta of the Amazon. In fact, Maranhao is known as the "Babassu State," possessing, it is estimated, more than a billion of these palms. Much of this area has never been explored, yet the annual harvest of 40,000 tons of babassu kernels gives employment to about 75,000 people. With development of the existing railroads and highway system in this region, it is believed that enough babassu can be produced to fill United States needs for the type of lauric acid oils formerly supplied by Philippine copra and coconut oils.

Babassu fruits, growing in bunches weighing up to eighty-eight pounds, bear about sixty-seven per cent oil. As they fall to the ground when ripe, picking is unnecessary. They must be cracked by hand, however, as machine cracking of the hard-shelled babassu has not proved satisfactory. This is generally done by native women tapping the nut with a small, heavy stick on the blade of an ax, which is held between their knees. A fast worker will crack a nut and remove the kernels in forty-five seconds.

Rubber development is of first importance in the State of Para, which embraces the lower Amazon and its delta. However, the region is also rich in babassu and such other oilseed palms as the spiny-stemmed murumuru. Andiroba oil, extremely useful as an antiseptic for insect bites, is produced in some quantity in Para. The United States vegetable oil mission is of the opinion that andiroba would make a good base for laundry soap in this country.

Little increase in the collection of oilseeds can be expected, however, because of competition with rubber production. Only when more labor and better rail transportation are provided will oil from babassu, murumuru, andiroba and other trees flow in greater quantities from the Para forests.

In the State of Piaui, which lies along the eastern border of Maranhao, the story is different. A road building program is already in progress and it is conservatively estimated that vegetable

Bureau of Foreign and Domestic Commerce

Native women crack the tough babassu nut by hand—generally by tapping it with a small, heavy stick on the blade of an ax

Pan American Union

Billions of babassu palms grow in the Amazon Valley

Pan American Union

Large babassu nuts yield sixty-seven per cent oil

Dende palm and, (at right) its oil-producing fruit

oil production in this region was doubled in 1942. Along with its abundant forests of babassu, Piaui, like many of its neighboring states, has a rich resource in carnauba palms, valuable as wax producers. With approximately 11,000,000 of these trees, the state is making an intense effort to rival the State of Ceara as a producer of carnauba wax, which ends up in polishes for shoes and hardwood floors. These palms, however, grow in light stands, averaging only twenty to an acre. To achieve density sufficient to warrant cultivation, the state is planting 12,000,000 young trees in accessible areas.

Homer L. Shantz

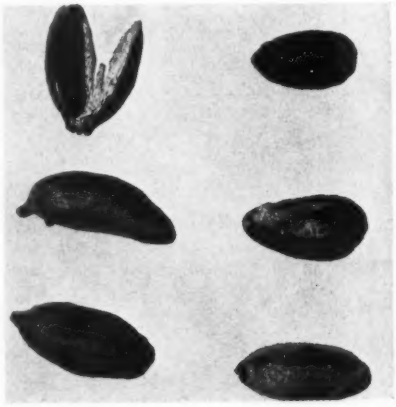
Along the seaboard south of Piaui is the State of Bahia, where castor beans form the leading oil-producing crop. Estimates place the 1942 Bahia castor crop at a million bags. But the state also has a large harvest of uricuri palm kernels. Many dende palms, introduced in Bahia years ago from Africa, are producing two types of palm oil, one from the pulp or pericarp, the other from the kernel. These oils are urgently needed in the United States to replace palm oils formerly imported from the Netherlands Indies and West Africa. Bahia also contains a great number of oil producing palms related to the babassu, chief of which is the Bahia-piassava.

Fortunately, transportation is not a serious problem in Bahia, and there is plenty of labor. In addition to federally-owned and state-owned railroads, there are good highways.

North of Bahia, and east of Piaui, is the State of Ceara, where the government is experimenting with the development of the valuable oiticica, a member of the rose family, by budding. And well it might, for Brazil's oiticica trade is attracting wide attention as a potential source of vegetable oil to replace China's tung oil, now cut off by the war. While not possessing all of tung oil's qualities, oiticica has excellent properties of its own. Valuable as a fast drying oil, and one that may be used in a mixture with other drying oils, it has many industrial uses. Thus, its market may develop as a complementary product rather than a substitute.

Bureau of Foreign and Domestic Commerce

Brazil is developing the valuable oiticica tree, the nuts of which (at right) produce a fast drying oil similar to China's tung oil



National Paint, Varnish and Lacquer Assn., Inc.

In the Ceara-Pernambuco area also grow most of Brazil's coconut palms. Export of copra and other coconut products, while never great, had practically ceased before the war, but they might become commercially valuable again in the not too distant future.

This, briefly, is the vegetable oil picture as viewed today in the lower Amazon Valley. It is not complete in that the mountainous states of Paraiba and Pernambuco, as well as the southern states of Minas Gerais, Sao Paulo and Rio Grande do Sul, all of which were visited by the United States vegetable oil

(*Continuing on page* 91)

INDIGO TO DUCKS

The Land Story of the Carolina Low Country

By SIGMUND SAMETH

Tidewater land, where fortunes were made and lost,—now sanctuary for wildlife

THE sun was low, just peeping over the horizon. Otherwise I would have missed it—missed a sight so strange that I pulled my car off the road, switched the ignition, and tried to puzzle out the mystery.

Stretching as far as I could see were barren flats. That didn't surprise me. Untended tidewater land is common in the Carolina Low Country, south of Charleston. You can buy all you want for a few dollars an acre. But in the early morning light I saw something more striking. The oblique sunlight cast every irregularity of terrain into sharp shadow. Plow furrows, silted and worn down almost to level, became visible. Then the significance of the roadside scene dawned on me. I was looking at what a century before had been a field of Sea Island cotton.

The land has a story of its own to tell, and what a gripping theme—this "biography of an acre." It's a tale of virgin earth fallowed for centuries before the planters came; of fortunes built and fortunes toppled into the loam from which they sprung; of land utilization and of land misuse; of greedy croppers who robbed the earth of its fertility the way a miner strips a mine; and of the long, slow, uneconomic process of putting marginal acres back into production for human needs.

Happily for the historian, the story is documented. Musty colonial records in the archives, travelers' journals of a bygone era, yellowed files of newspapers —from these can be pieced together the tale of this Low Country acre. And driving down U. S. Route 17 in South Carolina, one can watch the present chapter being written.

The first colonists to the South Carolina Province in 1670 brought with them the seeds of most of the common Old World plants. Before the year was up Joseph West, deputy to the Lords Proprietors, introduced cattle and "hogges." The hopeful agriculturalists even tried out such exotic crops as olives, tea, ginger root, oranges and mulberry leaves for silk-worm culture. Only the last showed any financial success and by 1707 Nathan Johnson was making eight thousand dollars a year out of silk alone, while other plantation owners exported a few hundred dollars worth without materially reducing other farm work. Negro children fed the silkworms, a time consuming process. Few mechanical aids to silkworm culture had been invented.

During these early years of settlement the main source of income in the Low Country was the sale of skins, lum-

Backwoods agriculture was transformed to plantation scale by indigo and Gullah negro slaves

ber, pitch, turpentine and resin. Every settler hired one or more Creek or Cherokee Indian hunters to provide game. The pay averaged twenty dollars a year for each hunter in addition to supplying him with a matchcoat and his powder and shot. Contemporary chroniclers record that each hunter could supply wild meats the year round for upwards of thirty people. Game depletion did not become a conservationist's headache until centuries later.

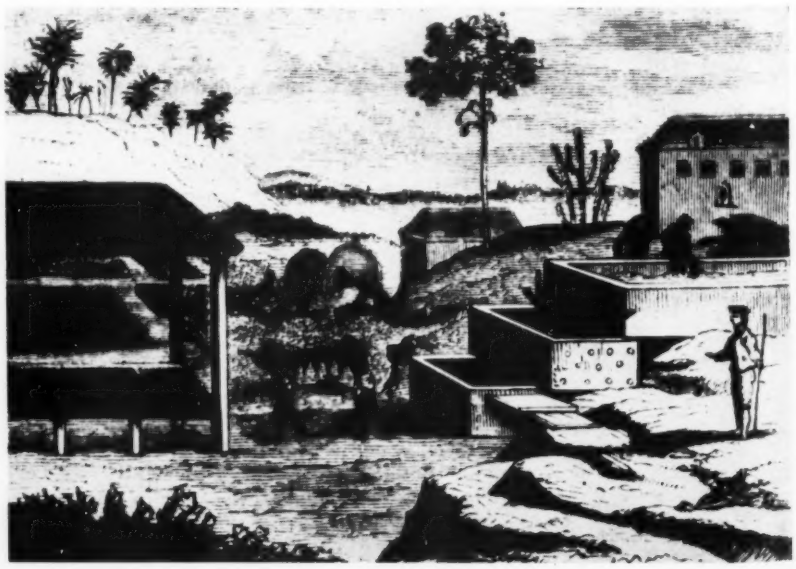
Around 1741, backwoods agriculture in Carolina suddenly blossomed forth on a plantation scale. Indigo had arrived. The era of great agrarian fortunes was beginning.

Miss Eliza Lucas, of Charleston, actually introduced the plant. From her father in Antigua, where it had been grown successfully for years, she received a small packet of seed. A few years of trial proved its adaptability to Carolina soil, the vivid blue powder extracted from the plant being equal in quality to the famed indigo of Hindustan. England clamored for all the precious dyestuff which its colony could produce. Growers doubled their capital every three years. In 1747 Parliament made indigo growing even more profitable by awarding a bounty of six pence for every pound produced in Carolina.

The British bounty was aimed at raising colonial production so that inferior French indigo could be forced off the world market. Trade annuals for 1747 show that British dyers were using 600,000 pounds of the French product at an average price of five shillings a pound. Stimulation of Carolina indigo culture not only excluded French indigo from British markets but also helped American colonial planters to undersell French indigo even in general European markets. Carolina soon was making well over a million pounds of indigo every year.

Behind this picture of bitterly contested international trade was the important producing unit—the indigo plantation itself. A thousand acres was not uncommon as a single lush indigo holding. Governor Glen, in 1750, wrote to a friend in England: "An acre of good land may produce about eighty pounds of indigo and one slave may manage two or three acres and raise provisions besides and have all the winter months to saw wood and be otherwise employed. . . ." With each barrel of dyestuff bringing roughly five hundred dollars, the trade was extremely profitable.

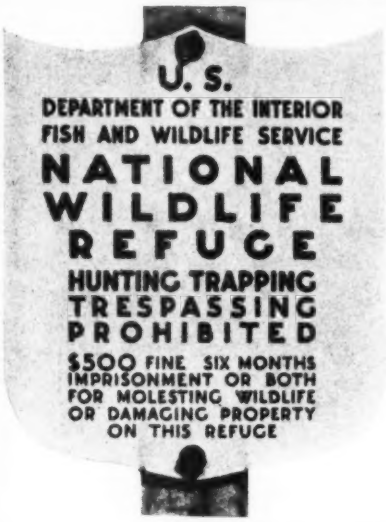
Indigo was cut in bloom when the leaves were full of the juice which contains the dye. The harvest occurred about four months after planting. Strong Gullah negroes hauled the limp plants by ox-cart to the great plantation fermenting and macerating vats where, after the top water had been drawn off, the remaining paste was scraped into blocks and dried in the sun for export. Indigo scrapings which remained in the vats were appropriated by the slaves who mixed them with clay to make a crude paint for their shacks. To this day the favorite decoration scheme of Low Country negroes is the gaudy blue reminiscent of indigo days.



From fermenting vats such as these came the Carolina grown indigo that captured world markets. This era ended with the Revolution

Sara Trenholm

Rice put the freshwater rivers to work. They were diked and drained in an elaborate system of tidewater irrigation



King Indigo, however, was soon to be dethroned and the land made to yield another crop. This was rice, second of the great Carolina wealth makers. For years it had been grown in small quantities by the slaves. Now it displaced indigo itself.

Captain Jn. Thurber had presented Dr. Henry Woodward, of Charleston, with a sack of rice in 1686. It had been left over from his ship's provisioning in Madagascar. The good doctor gave away small quantities of this seed to anyone who desired to experiment with the new crop, but in the scramble for indigo wealth the Madagascar rice was forgotten for a century.

After the American Revolution black times faced indigo growers. Their sixpence bounty was gone. Growers in the East Indies and in Bengal flooded the world market. Although a hundred years was yet to elapse before synthetic dyes would sound the death knell of natural indigo, the profit had already been halved, then cut again. Planters turned to rice as an export crop and the rich land began to yield new profits. For three quarters of a century it made fortunes for some of the proudest names in

Sara Trenholm

Remnant of the rice era is this old floodgate and canal. Today, many such areas are included in one of the largest wildlife refuges along the Atlantic

Carolina. It was grown in the inland swamps and watered from embanked ponds called "reserves." Sacks of it passed as legal tender. Its export received tremendous impetus through the invention of a combined hulling and cleaning mill. On every hand the cry was for more rice lands.

The demand for increased acreage brought an agricultural innovation to the Low Country—tidewater irrigation of rice fields. General Pinckney and Gideon Dupont developed the system whereby the tide was made to do the work of the hoe. Freshwater rivers whose sluggish drainage was reversed with each change in the ocean tides at the mouth were put to work. An elaborate system of banks, drains, cross drains, and quarter drains was used. Canals were dug and flood gates and trunks were put down. Cypress forests were felled and land which was half swamp, half water, was embanked, drained, and made ready for controlled flooding.

The tidewater method of rice culture met ridicule at first. David Williams, of Beaufort, was almost beaten for Congress when it was learned that he was constructing a five-mile dike on his plantation to grow rice in swampland. "Any man that thinks he can hold back the Peedee River is a fool," his opponents claimed. But Williams' dike held and the rice fields behind it continued to produce rich harvests for generations.

But King Rice tumbled also. After the Civil War and the freeing of slaves, labor costs made Low Country rice culture prohibitively expensive. Too, the tremendous drain of soil fertility was being felt. Moreover, upland rice cultivated in Louisiana, Arkansas and Texas, with the aid of labor saving machinery, was displacing the Carolina product. The last commercial planting in Carolina occurred in 1926. The years when production topped a million and a half pounds faded into the obscurity of recorded history.

King Cotton, however, was still the farmer's standby. The Low Country planters had found it a source of extra revenue ever since 1747 when "nine bagges of cotton-wool" were exported from the province. Especially desirable was the long staple Sea Island cotton, the fibres of which had greater length than common or "up country" cotton. In the eighteenth century, before the invention of the mechanical cotton gin it had a great advantage over short fibre cotton in that it was less difficult to pick free of seeds.

Cotton, both the upland variety and the precious Sea Island type, was cultivated with no thought for the future. Its one-crop plantings have been likened to soil-mining—removing natural fertility and replacing nothing. Cotton planters abandoned each field as it became exhausted. Land was cheap—fertilization dear.

During the Civil War and the bitter period of reconstruction there was little if any outside sale of agricultural products. King Cotton became moribund. Plantations grew food crops, and this diversification which was forced upon them proved beneficial. As for the famous Sea Island cotton, it has become practically a botanical rarity, victim of the boll weevil. Except for a few small plantings, the most tangible evidence of it today are the abandoned tidewater fields, their dikes in disrepair, where husky dark-skinned "choppers" cultivated the plants during the hot growing season.

Cotton—particularly the long staple Sea Island variety —was the last of the Low Country kings to surrender

The cycle from indigo to rice to cotton has now entered its fourth phase—that of scientific agrarian planning. Farseeing governmental and private agencies realize that the Low Country's only hope is to restore some of the treasures which have been robbed from the soil. Brush burning is discouraged. Miscellaneous vegetal trash is too valuable to fill gullies and check water erosion. County agents preach the value of contour plowing and strip farming. It saves tractor fuel, it's easier on draught animals, and mainly it keeps the top soil where it belongs, not in the rivers, being washed out to sea. Crop diversification is stimulated. No sharecropper's tiny patch is too small to be overlooked by the county farm agent in his unrelenting search to increase agricultural efficiency. Moreover the "textbook farmer" commands new respect now, because he has shown results.

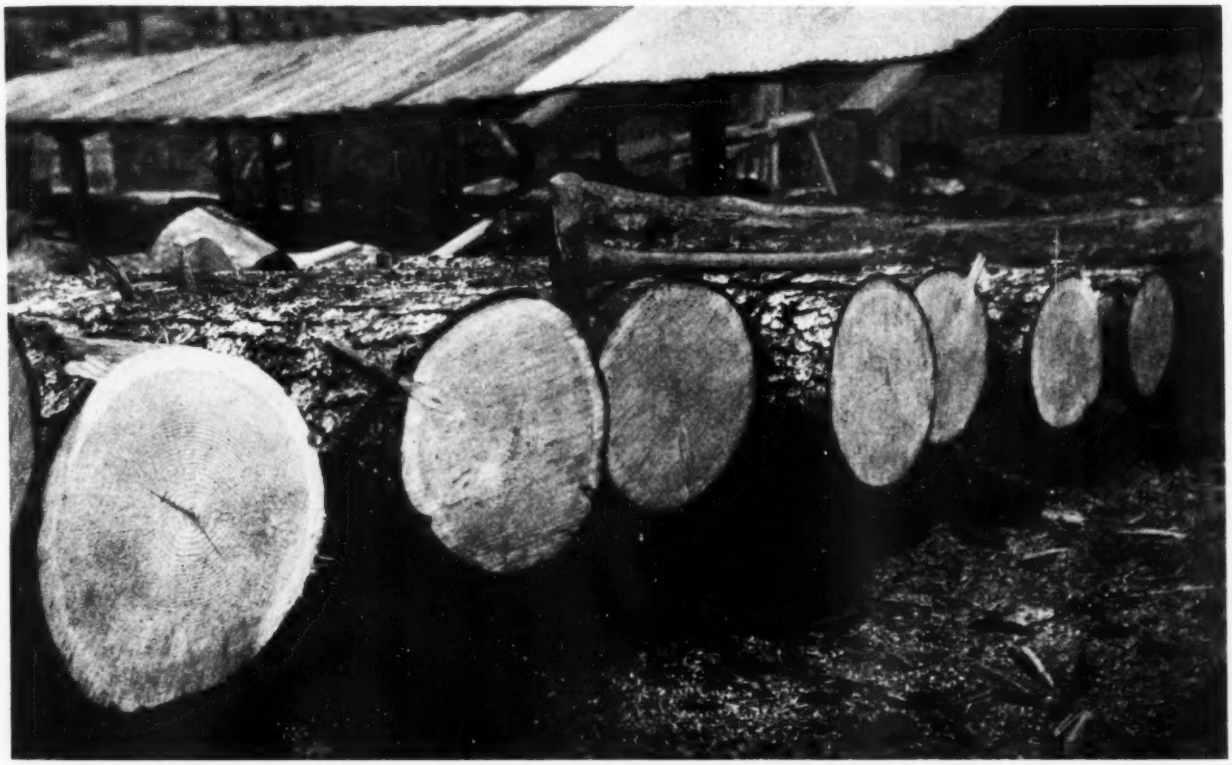
In the Low Country the Future Farmers of America are doing a grand job too. Carolina youths operate their own canneries and purchasing cooperatives. They learn how to keep livestock, from which an increasingly greater proportion of farm revenue is bound to come. Not the least of their projects are the pine forests they maintain where timber is harvested as a crop instead of indiscriminate cutting of every standing tree. Well publicised by means of large weatherproofed posters, these roadside timber farming projects impart a living message of conservation to every passerby.

Nor has wildlife in the Low Country been neglected. Old flooded rice fields now produce seed crops to tempt wild duck. Sprawled across the southern border of the state, the largest of the new wildfowl refugees offers a stopover site for birds in the Atlantic flyway. The same system of canals and drainage ditches and complex floodgates which the rice planters once used are now operated by biologists of the U. S. Fish and Wildlife Service who play generous host to hordes of migrant ducks. It's a far cry from the rice paddies to a brace of winging mallards, from the indigo vats to the growing southern pine pulp industry, from Sea Island cotton on creaking ox carts to lettuce, potatoes, string beans, cucumbers, and garden peas rumbling through the night to the big northern markets. But the land of the Low Country has always produced and it will keep on producing.

TIES FOR TOTAL WAR

Small Mills Help Railroads Keep Troops and Materials Moving

By GORDON D. MARCKWORTH



Logs ready for the mill. Ideal tie timber is long and straight, not too large, not too small

WHEN Japan struck at Pearl Harbor in December of 1941, it was not known whether the enemy would withdraw or move on against the west coast of continental United States. In any event, those responsible for the safety of this nation were taking no chances. Thousands of troops, along with supplies and equipment, were immediately dispatched to reinforce western defenses. Their movement was rapid and efficient—one of the miracles of the present war. Since then troops and supplies have continued to flow back and forth across the continent, a tribute to America's great system of railroads.

In the eyes of the average person this movement has taken place and is taking place on ribbons of steel. But to railroad men, the wooden ties that hold the steel rails in place and also act to cushion the speeding cars, are as important as the rails themselves. Both—steel rails and wooden ties—are critical materials of war. Without them, transportation—the backbone of the war effort—would be broken.

Thus, millions of ties are now coming from the forests of the country to maintain existing railroad lines, to build new ones around Army and Navy establishments, and to provide essential rail transportation for American fighting forces in other parts of the world. In addition, England and other allies of this country are buying ties for their far-flung military installations.

With most of the large sawmills, which formerly produced railroad ties as a matter of course, just as they produced siding and two-by-fours, now busy filling war orders for other types of material, war demand for ties is being met by many small mills. These are located in areas where timber is particularly suitable for the manufacture of ties—that is, long and straight with little taper, not too large, not too small.

Second-growth Douglas fir from eighty to one hundred years old makes ideal tie timber as it works easily and is relatively cheap. This grows in abundance in Lewis County, Washington, and as a result the busy town of Morton has become the tie center of the nation. Probably fifty mills are operating there as this is written, and they are producing a lot of ties. Just how many is impossible to say, but a check on car loading last August revealed that an average of at least 10,000 ties were shipped daily from the Morton area. This is enough to build nearly five miles

of track, or in a year enough to lay a railroad from Seattle to St. Paul, Minnesota.

Morton, located in the foothills of the Cascade Mountains about thirty miles southwest of Mt. Rainier, is a typical modern logging town. Its one main street is flanked by stores, hotels, restaurants and bars maintained for loggers. The mountains to the south rise abruptly and several tie mills can be seen along the break at the top. Indeed, it is impossible to drive out of Morton in any direction without seeing tie mills somewhere on the sides of the mountains. On the outskirts of the town to the east, west and north are loading docks for ties, lumber and pulpwood, as well as loading dumps for logs, peeler blocks, poles and piling.

There are several interesting stories of how the timber stands around Morton, so desirable for the manufacture of railroad ties, came into being. One is that early settlers from the Carolinas and Tennessee came into the country about 1850 and cleared land along the banks of Beaver Creek. Like all settlers, they disposed of slash by burning, but made the fatal mistake of doing so on a dry day in September. As the humidity —about which they knew nothing—was low, the fire moved rapidly to the surrounding timber, crowned and spread destruction to thousands of acres of fir and hemlock on both sides of the Tilton River and across the ridge as far south as the Cowlitz River. Because of the speed of the fire, the cones of the trees were not destroyed and the area became seeded almost immediately.

To the casual observer this story might seem plausible, for as seen from the highway the timber appears to be about of the same age and rather uniformly distributed. Closer examination, however, reveals the stands to be patchy and the trees varying in age. Furthermore, the type map prepared by the U. S. Forest Survey furnishes definite proof that the timber is not uniform. This means that the stands did not originate from one conflagration which destroyed the whole area, but from smaller fires occurring at different times, probably set by lightning.

Whatever the origin of this timber now so vital to the winning of the war, there is little doubt but that Morton can lay claim to the honor of being the tie capital of the nation. From a few mills which began operating during World War I, this Cascade town now supports around fifty, with others in the process of construction.

To visit these mills is to gain an insight into American mechanical ability and ingenuity. The larger ones, those cutting from 400 to 600 ties daily, are well equipped, many with diesel engines to operate mills and steam engines to haul in the logs. Most of the smaller units, on the other hand, operate with gasoline motors, usually discarded automobile engines, although when sufficient funds are available, diesel motors for the mill are being installed.

The typical small outfit will utilize three automobile engines, one to operate the mill, one to skid the trees, and the third to drag them to where they are sawn into eight-foot lengths and shunted onto the rollway leading to the saw-carriage. Buick, Ford and Studebaker engines outnumber any other makes; in fact, almost every small mill has at least one Buick motor. These, together with motors from Dodge, Packard, Cadillac, and other cars which had once been running smoothly under shiny hoods are now steaming and knocking in the open alongside the more plebeian motors of White and other trucks. A most surprising thing was to discover a very efficient mill being operated by an engine which had once furnished power for a Stutz motor car. That these workhorse engines performed faithfully before they became power plants for tie operations is attested by the fact that many of them still have the instrument panels intact, and there the speedometer dials show mileages of fifty, sixty, or seventy thousand.

As to the operations, all are run essentially the same. After the trees are felled no limbing or trimming of the tops is done. Butt-end first, they are dragged toward the mill by a cable run through a block hung seventy or a hundred feet above the ground on a nearby spar tree. the cable being wound on a drum and powered by one of the automobile engines. This is the conventional "high lead system" of the Pacific Northwest. In this process of dragging the branches and tops of the trees are torn away.

Dropped at the spar tree, the trees are again dragged, this time top-end first, in a log chute leading to the mill. The cable for this job is attached to another drum and powered by a second engine. At the mill end of the chute a drag-saw cuts the trees into proper lengths before they are ready for the saw-carriage.

In the sawing, some mills cut only ties. Everything else is waste and is either burned or piled up beyond the mill. The more progressive operators attempt to salvage the slabs and cut part of them into "side lumber," usually two-by-fours, and the balance into firewood. As the mills are located long distances from consumers, the sale of firewood is not always possible. Nevertheless, much more could be salvaged than now is. There are tie mills in the Morton area utilizing everything but sawdust, which offer examples for others to follow.

In the operation of the mills as much originality is shown as in rigging up the machines. Anywhere from three to twelve men may be employed to keep the mill supplied with logs and in operation. The larger the mill, the more men required. The smaller mills do not use enough trees to keep a set of fallers busy all of the time, so the men may be shifted from one job to another. In one instance a set of fallers were employed by three separate operators, working

Preview of the new slogan adopted for the 1943 Wartime Forest Fire Prevention Campaign to be directed by the United States Forest Service. Contributed by the National Advertising Council, it will appear on 25,000,000 pieces of printed matter, to be distributed throughout the nation, beginning March 1.

Second growth Douglas fir in abundance makes Morton, Washington, the tie center of the nation

two days a week for each. In another, a mill was operated by three men, the owner and two helpers.

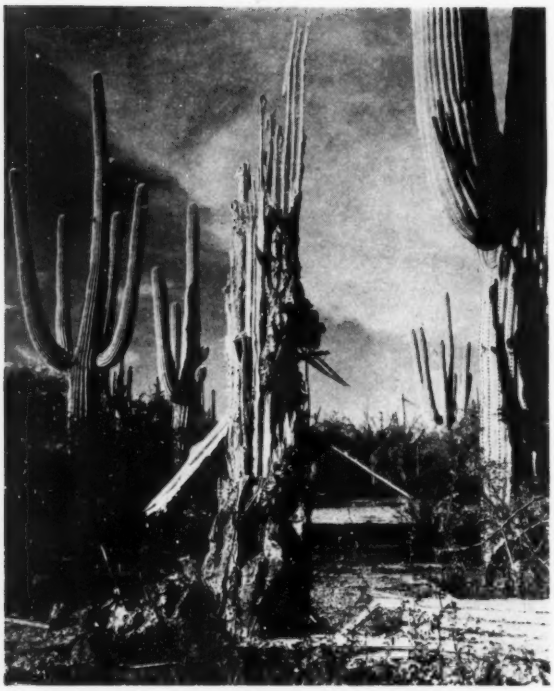
As small as it was, however, this mill was run efficiently and at a profit—a good profit. The logs were skidded to the mill with an old Fordson motor, the log drag and drag-saw were operated with a Buick engine, and the mill was powered by a motor from a White truck. In the morning when the crew arrived, enough trees were skidded to the mill to make the day's run of a hundred ties. These were run through the mill and the ties stacked on the loading platform. As the mill was four miles from the highway at the crest of a steep road, the sale of slabs was impossible, so they were "shot off the mountainside."

After the day's run had been sawn, the two helpers went into the woods and felled trees for the next day. The owner, meanwhile, loaded the ties on the truck and performed the necessary odd jobs around the mill. At quitting time all got on the truck and the owner drove to Morton where he unloaded. The daily cut of this mill, and others like it, was small but the average production per man was higher than most outfits, even the large ones.

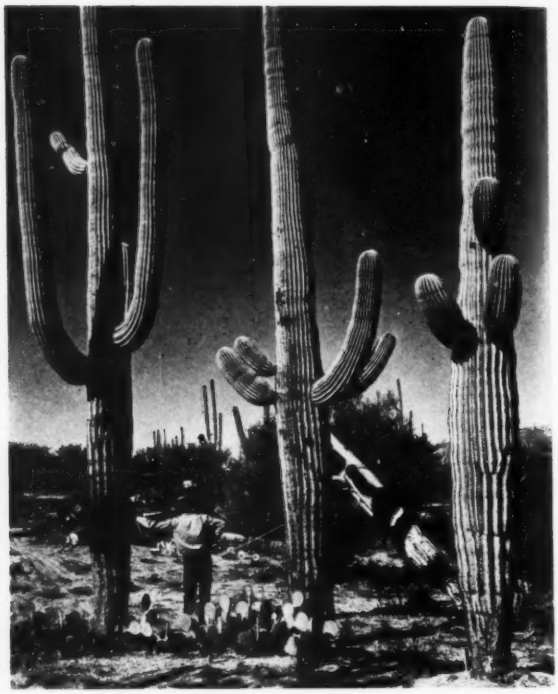
Many of these small mills operate on

(*Continuing on page* 96)

From the fifty small mills around Morton come thousands of ties daily for wartime transportation



Skeleton in the desert is this dead saguaro, victim of a tiny bacterium



A diseased giant, weighing nearly six tons, is pulled to earth by a tractor

FIGHT FOR

By NANCY LUNSFORD

TROUBLE has developed in one of the most unusual forests in the United States. East of Tucson, Arizona, there has been set aside the 63,000-acre Saguaro National Monument to preserve the giant saguaro cactus, unusual and fantastic growth found only in southwestern Arizona and northern Sonora in Mexico. The odd and beautiful giants have been attacked by a virulent rot which has been destroying them at an alarming rate.

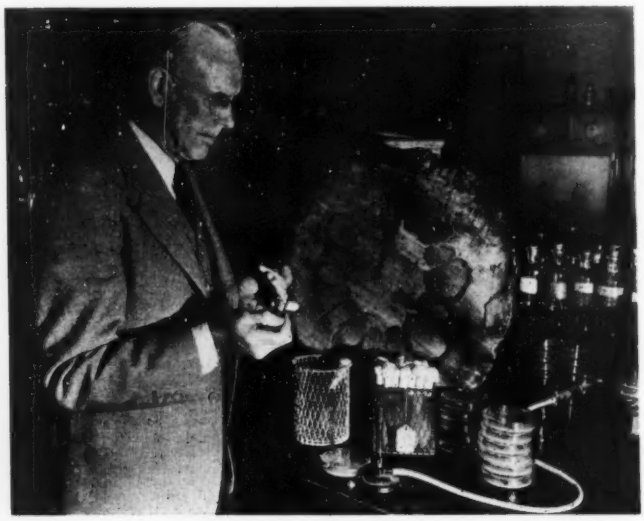
Arizona has long been noted for its cactus growth, and particularly for the saguaro, the white wax-like blossom of which is the official flower of the state. Climatic and soil conditions, particularly around Tucson, seem well suited to the desert giants, and there they are found in veritable forests.

When in the Summer of 1939 it was noticed that far more of these unique giants were dying than was possible from natural causes, citizens became concerned. An investigation revealed that a rot which had been known for at least forty years to attack the cactus was spreading rapidly and killing the saguaro by the hundreds.

Measures to control or cure the disease were sought. The University of Arizona, under the leadership of Dr. James G. Brown, plant pathologist, was given the task in cooperation with the Bureau of Plant Industry of the Department of Agriculture, and the National Park Service.

Work began in the Saguaro National Monument where one square mile was laid out as an experimental plot. The 13,000 saguaro growing in this plot were staked and numbered so that a case history of each could be obtained. One half of the section was marked for treatment, the other half to be left in its original state to serve as a check on the effectiveness of the treatment used.

In the beginning nothing was known concerning the cause of the rot or of its action. Since then, however, valuable



Dr. James G. Brown, plant pathologist, who discovered the cacti-killing germ

In preparation for burial, the massive cacti are sawn into five-foot lengths

A crane is required to load the large butt sections for the haul to the pits

THE CACTUS

Photographs by Western Ways

if incomplete data have been obtained. It has been discovered, for example, that the rotting is caused by microscopic bacteria which enter the roots of the plant, or find their way into the body by means of a wound. It has also been found that the bacteria is capable of working very rapidly, sometimes causing death to a plant within two weeks.

All dead or badly diseased cacti in the treatment area were marked for disposal. As the saguaro frequently grow to a height of fifty feet, with a single plant weighing from six to ten tons, this was by no means a simple job. Nor could they be completely burned, because of interior moisture. Finally it was decided to dig huge pits in the sand and bury them. Before being covered, however, they were treated with a liquid insecticide and kerosene, which served to kill the germs of the rot. The ground surrounding the site of the badly diseased cacti was likewise treated.

Dr. Brown, supervising all laboratory work, has compared the saguaro in its present difficulty to a Goliath beset by a microscopic David. In the same vein would be a comparison to Achilles and his vulnerable heel, for upon first examination, the saguaro seems to have been extraordinarily well prepared by nature to resist the attacks of natural enemies. Its body is composed of a series of pleats resembling those in an accordion. In the rainy seasons its spreading roots draw the moisture toward the plant, and as it is absorbed the sharply folded pleats expand and take on a rounded appearance. After a heavy rain, a single saguaro has been known to absorb as much as a ton of water. Its tough outer skin protects the inner moisture from evaporation.

But even this natural protection does not seem sufficient to ward off the bacterial rot. So far the search for a cure is only in the experimental stage, but at least a start has been made in the fight to save the rare and beautiful saguaro.

Before being covered with dirt, the diseased cacti is treated with insecticide

A Brief Journey to the Home of—

The Santa Lucia Fir

By MAUNSELL VAN RENSSELAER

As told to McDonald White

MORE than 5,000 feet below us the lower slopes of the Santa Lucia Mountains sheered off abruptly into the Pacific Ocean. Along the edge of the cliffs, several hundred feet above the sea, the famous San Simeon-Carmel Highway bordered the shoreline like a gray ribbon. Small specks that were automobiles crept ant-like along the pattern of the winding road. Far out on the horizon a ship moved slowly southward, probably bound for Panama.

It was the fall of 1940 and we were standing outside the Cone Peak fire lookout station, which is perched on the summit of this bald-domed granite mountain. A cool breeze from the ocean fanned our faces, intensifying the exhilaration we felt from the vastness of the panorama. Being so high above the ocean, and still so near, gave us a feeling of unreality. Yet here we were, at the end of the trail; a fitting climax, indeed, to a trip that offered so many and such varied rewards.

Actually, we did not come all this distance just to feel like eagles atop some high place. Our primary purpose was to explore a colony of the rare Santa Lucia fir, *Abies venusta*, which is endemic to a small region in the rugged Santa Lucia Mountains of Monterey County, California. Foresters and botanists alike regard this tree as one of the most remarkable of all firs; yet relatively few persons have seen it growing in the wild.

Up to a few years ago, these mountains in the northern part of the Los Padres National Forest were inaccessi-

Joseph Muench

A Santa Lucia cone—bristly, pitchy, pride and joy of the seed-pod collector

William Jeffery

Pine Valley, in the Santa Lucia Mountains,—to which the natural habitat of this most curious and beautiful tree is restricted, an area scarcely forty miles in length and only a few miles wide

ble, except by foot or horseback. Now "truck trails," constructed by the Civilian Conservation Corps under the direction of the United States Forest Service, lead into this remote area, about 100 miles south of San Francisco.

One of these truck trails leads directly into a locality of Santa Lucia firs on the northerly slope of Cone Peak. As far as we know, it is the only sizeable stand of these unusual trees which may be reached by automobile.

Outside of Forest Service circles, the road is comparatively unknown. Yet many botanists and tree enthusiasts, knowing about the trees, have frequently expressed a desire to see them growing in their natural environment. Therefore, a description of the trip, with specific directions on how to get there, may prove of interest to both armchair and active travelers who might wish to add this adventure to their itinerary at some future time.

How many thousands of years these firs have been growing in this isolated spot is pure conjecture. The Franciscan Padres at Mission San Antonio de Padua knew about them and utilized their resin for incense in religious ceremonies. They were first called to the attention of scientists in 1831, by Thomas Coulter, the famous botanist. At the same time, and on the same trip, Dr. Coulter discovered the bigcone pine, *Pinus Coulteri.* English horticulturists, including Douglas, Hartweg and Lobb, soon followed in quest of seed. Doubtless these men made their headquarters at the mission.

The Santa Lucia fir—useful only as an ornamental—has been grown successfully in temperate sections of Great Britain and northern Italy. It is not hardy in eastern United States, but thrives in cultivation along the coast of California, north of its natural range. But for reasons that still defy explanation, the tree has never been grown successfully south of its native habitat, an obstinate characteristic that has long puzzled horticulturists.

Two-inch seedlings brought to the Santa Barbara Botanic Garden six years ago, and cared for under the most ideal conditions, are now only about six inches tall. This interesting horticultural problem, together with the tree's unusual features, gave us the incentive to re-visit the native stands. We hoped that further first-hand study of the natural growth habits of the Santa Lucia fir might eventually help solve the riddle for its improved cultivation elsewhere as an ornamental.

Our plan was to approach Cone Peak from its eastern slope and return down the west side. This affords a greater variety of scenery and is the recommended procedure. So, starting from Santa Barbara, we drove north on Highway 101 to

Noted for its beautiful form, tall crowns end with spear-like sharpness, distinguishing it from all other firs. In the narrow and sharp summit is borne its precious crop of cones

Bradley, leaving the main highway three miles beyond to turn northwest on a by-pass that winds through the lush Jolon Valley, on the historic El Camino Real. Soon we reached the impressive ruins of Mission San Antonio de Padua, which was founded by Fra Junipero Serra in July, 1771, the third of the chain of early California missions.

By 1805 more than a thousand Indians were living on the mission grounds. Under the guidance of the resident padres, they worked in the fields and performed all necessary tasks of maintaining the colony. After 1845, however, the mission deteriorated rapidly, until today only a few of the original walls remain standing.

After spending some time here, we drove along the little-traveled Naciemento Road into the dry, semi-arid foothills, sparsely covered with blue oak, valley white oak, California live oak, interior live oak, scrub oak, Digger pine, and bigcone pine. The latter is restricted to scattered groves in California and is not found elsewhere. It bears the largest and heaviest cones of any pine in the world's sylvan domain.

Along the stream courses we found western sycamore, black cottonwood, white alder, and various species of willow. At higher elevations, in the cooler cañons, we found incense cedar.

Ordinarily, this is a region of comparatively mild winters, with occasional snow on the higher peaks. Average annual rainfall is approximately thirty inches. But inland from the coastal front, the climate is oppressively hot and dry in the summer. Under these conditions most of the hills and mountainsides are naturally covered with chaparral, the thick, impenetrable native shrubbery of southern California.

Approaching the coast, the road ascends the high ridge of the Santa Lucias, overhanging the ocean. We climbed steadily for a considerable distance before reaching the saddle of the ridge. Then we turned due north, continuing up the ridge on the Cone Peak truck trail.

Should the term "truck trail" prove confusing to prospective travelers, it might be well to explain that it is actually a road built for strictly utilitarian purposes, mainly to make the district accessible to Forest Service trucks and fire-fighting crews and equipment. Driving with an extra degree of caution, the road is adequate and safe. Furthermore, it is widened at intervals to allow for passing vehicles, if necessary.

From vantage points along the ridge, we observed large and impressive stands of redwoods in the narrow cañons facing the sea below. On our return trip down the western slope of the mountains, we had a much closer view of these ancient trees. They do not extend over the ridge at any point in this region.

It will be recalled that the redwood inhabits a narrow strip, about 450 miles long and twenty miles in width, along the Pacific Coast from the southwestern tip of Oregon to the southwestern corner of Monterey County, California. And it was of interest to note that we were within fifteen miles of the southernmost stands.

According to C. S. Robinson, wildlife technician of the Los Padres National Forest, the southernmost stands of both redwood and Santa Lucia fir

(*Continuing on page* 93)

From the lookout station on the granite cliff we looked down over a thousand feet, out over the blue Pacific and to the San Simeon Highway, stretching like a ribbon along the rugged shore

THE ELMS AND THE WAR

Beset by Manpower and Financial Problems, the Fight Against the Dutch Elm Disease Goes On

By E. G. BREWER

WAR has made heavy inroads in America's twelve-year-old campaign to conquer the Dutch elm disease. But the fight still goes on. It goes on because a limited program is justified by the high and irreplaceable values that may be lost if the disease is uncontrolled. There seems to be no reasonable argument for a full program of eradication under the present national emergency. The nation's fight now is against an infinitely greater peril. But it is important to prevent or retard the spread of the disease. If this is not done, new millions of American elms will be destroyed, and the eventual cost both in manpower and dollars of removing the dead trees will be enormous.

Methods of operation against the disease during the past two years have been greatly complicated by manpower and financial problems. Efficiency has been reduced. Work in large and probably important areas where disease occurs has been omitted. In others coverage has been speeded up. The WPA manpower now available is, in general, less capable than in pre-war years. And even this, according to press reports, will not be available after February 1 when the WPA is discontinued.

How these problems will affect the chances for ultimate success in eradicating the disease remains to be seen. At the close of 1940 definite progress seemed certain. The present status of the disease with regard to control and eradication and the promise of the future is not clear. However, inability to work in parts of the major region and the speeding up of the work has probably not resulted as yet in any great or insurmountable setback.

At the present time, the major region of infection consists of the southwestern corner of Massachusetts, the western half of Connecticut, the lower or southeastern part of New York, the northern half of New Jersey, and a strip along the eastern border of Pennsylvania.

The disease is also considered active in the following isolated areas: The Binghamton area of New York; the Wilkes-Barre area of Pennsylvania; around Baltimore, Maryland; the Cumberland, Maryland, and Wiley Ford, West Virginia, area; the Athens, Ohio, and Bellville, West Virginia, area; the Indianapolis, Indiana, area; and the Old Lyme, Connecticut, area.

The growth since 1932 of infected area in the major region is shown in the table below. This increase is not considered the result altogether of a regular and proved annual spread of the disease. Carrier beetles do extend the area, but the increase is also due to the new discovery each year of old, established infections. Sometimes these can be determined by the isolation of the fungus causing the disease from older annual rings in infected elms, as was the case in Binghamton and in Dutchess County, New York. Sometimes a large number of diseased elms separated from other known infected trees suggests that the disease was introduced at some earlier period and has had time to spread locally. This was apparently the case at Wilkes-Barre, Pennsylvania. Sometimes an old establishment of the disease may be unsuspected because the originally infected trees have died or been removed, or have not as yet been discovered.

Records reveal a distinct increase in the number of diseased trees found by years up through 1938, when 18,152 were located. From that year on the number of cases discovered has declined. In 1939, 10,786 were reported; in 1940 there were 4,444; in 1941 the figure dropped to 2,691; and up to November 14, 1942, but 972 cases were discovered. This picture, unexplained, might lead to a possibly unjustified optimism as to the progress being made in the fight against the disease. Through 1940 the picture is reasonably accurate, but for 1941 and up to November 14, 1942, these figures do not reflect the entire story.

Owing to the increase in the territory to be inspected and to manpower and

	1934	1935	1936	1937	1938	1939	1940	1941	1942 (Approximate)
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	165
Connecticut	224	283	283	308	417	573	948	1,494	2,026
New York	838	1,495	1,682	1,943	2,552	3,639	3,642	4,290	5,008
New Jersey	1,402	2,528	2,826	2,971	3,126	3,610	3,449	3,876	3,924
Pennsylvania	.....	.....	.....	.....	87	620	760	977	1,322
Total	2,464	4,306	4,791	5,222	6,182	8,442	8,799	10,637	12,445

Area in square miles infected by the Dutch elm disease

High and irreplaceable values may be lost if the fight against the Dutch elm disease is abandoned. Here is an outstanding example

financial problems, it became apparent early in 1941 that scouting could not be conducted over the entire territory with the same thoroughness as in the past. Thus it was necessary to curtail the work area to the extent of altering the objective of the project, at least temporarily, in selected portions of the territory. This was accomplished by dividing the major infected region into territories of three categories. These were (1) an outer band, or zone, where the disease was largely scattered, roughly five miles in depth; (2) a series of so-called control areas which were selected by the cooperating officials of the states and consist primarily of developed areas such as cities, towns, parks and cemeteries, and in some instances highway and roadside trees; and (3) a larger remaining section consisting principally of undeveloped territory.

By omitting the usual scouting for diseased and insect-infested elms and the removal of diseased trees on territory in this third category, it was possible to continue the effort toward eradication in the active isolated areas and to endeavor to locate new infections at the margins of the major region in an attempt to prevent or slow down further spread. This curtailment of work within the major region accounts for the marked decrease in the number of diseased trees found during the past two years and hence reduces the completeness of the picture. On the other hand, the reduction for 1939 and 1940 are significant, despite the economies put into effect in securing adequate scouting over the essential area.

To some extent results in the isolated areas also show promise. No case of Dutch elm disease has been found at Cincinnati, Ohio, since 1930; Cleveland, Ohio; Brunswick, Maryland, and Portsmouth, Virginia, have not reported cases since 1935; and Norfolk, Virginia, has been visibly free of the disease since 1936. Conditions in these sites where the disease was formerly active but is apparently inactive at the present time are considered favorable for eradication.

There are two instances, however, where the disease has been rediscovered in apparently inactive sites. In 1941 a case was found in Baltimore, Maryland, after a lapse of four years. In 1942 a diseased tree was found in Old Lyme, Connecticut, also after a lapse of four years. These discoveries remove these areas from classification as inactive and emphasize the importance of continued scouting at locations apparently freed of the infection.

In all states of the major region the Department of Agriculture is working the outer, or scattered-disease, zone and a border zone beyond this, roughly twenty miles deep, not known to have disease. Beyond this latter zone a limited amount of rapid scouting is carried on in a few selected areas. Within the major region, inside of the scattered-disease zone, work is being conducted in the control areas in the states where the

(*Continuing on page* 94)

Doomed by the disease, the magnificent elm shown above was removed, with this result. Beauty, majesty and shade are lost

Editorial

A War Break—Beware!

IN casting up favorable war breaks of 1942, there is one that has been given little or no public mention. Nevertheless it was a break in our favor that might well rank with a victory at arms on land or sea. It was a battle that did not have to be fought—a battle that might have been catapulted by one of those climatically bad summer seasons which turn loose within our boundaries widespread outbreaks of destructive and terrifying forest fires. Had such a season occurred last year it would have been a victory for our enemies in that, based on what has happened in other bad fire years, it would have dislocated our war efforts on the home front in many sections and robbed us of timber critically needed for war use.

While forest fire agencies last summer did a good job under the trying conditions they had to meet in preparing for and dealing with the fires which did occur, chief credit for the favorable break must go to the weather. As a forest fire year, 1942 was one of those lucky years when weather conditions over the country as a whole were unfavorable both to outbreaks of forest fire and to their rapid spread by extended droughts and high winds. There were, it is true, localities where weather conditions were not so good and where some bad fires did occur. But by and large the weather was on the side of the United States from the standpoint of forest fires to an extent that has not often happened in recent years.

As a forest fire year, however, 1942 has a hang-over and a dangerous one. It is the danger that having had favorable weather conditions last year the public will become complacent in the belief that the country will be so favored again in 1943. Complacency on this or any other ground would be a stupid and tragic mistake. It means unpreparedness for a bad or even a normal fire season this summer. It would be on a par with assuming that favorable weather conditions having helped an army win one victory, the weather can be relied upon to help in winning future victories.

Experience has proved that the weather is the chief factor in determining good and bad forest fire years and no one can predict the weather far in advance. Experience also has proved that the only safe insurance against a bad year is to prepare not for the favorable year but for the bad one. At best adequate preparation for the 1943 season faces handicaps, especially in shortages of manpower and equipment, far greater than ever before. It calls for public alertness and participation, for public support and leadership everywhere, for public pressure upon Congress and the states to provide well in advance necessary funds and upon forest protective agencies to prepare and prepare well. There must be no underestimating the hazards to our war efforts—no complacency based on the false notion that because bad fires did not occur in 1942. they will not occur in 1943. The moral that is leaping out of 1942's fire record is "beware and prepare."

Conservation in the Peace

PRESIDENT ROOSEVELT'S message to Congress on January 7 was a sweeping and thought-provoking review of where this nation stands today in a world of conflict and confusion. Winning the war comes first and foremost, but in winning it, he declared, "we should never forget the things we are fighting for." He dissented emphatically and rightly from those who hold "that this is no time to speak of a better America after the war."

The problem of peace, including the right to employment and assurance against life's hazards, he pointed out, "will loom very large as a task of America during the coming two years." And he expressed the hope that the problem "will not be regarded as an issue but rather as a task for all of us to study sympathetically, to work out with a constant regard for the attainment of the objective, with fairness to all and with injustice to none."

The President's position, we think, is eminently sound and timely. It is humanly impossible and wrong to undertake to close men's minds and mouths against thinking and talking about problems of peace. As the war proceeds, thinking people are beginning to appreciate more and more that the task of drafting a durable peace may be as great or greater than that of winning the war. If it is to be a peace based upon practical principles of human liberty and security, the sooner those principles are delineated and kept in the foreground of public thought, the sooner and surer will a practicable and durable peace follow. As the President implies, argument now over methods and details should not be permitted to bog us down and confuse us as to the larger objectives and principles.

One principle, for example, which we think goes to the heart of a lasting peace but which now appears to be receiving little thought or consideration has to do with man's relation to the earth and his responsibility to maintain and increase the productive power of its soils. In simple language, this means conservation of the natural resources upon which mankind is dependent for sustenance.

For thousands of years civilization has been exploiting the earth's resources and its creative power to replace and increase them. As history shows, exhaustion or lack of natural resources among nations of the world has been a more than common cause of wars. Any peace, therefore, which does not take into account the dependency of peoples everywhere upon the earth's resources and which does not rest upon a concept of world wide conservation and amicable international exchange of raw materials, will lack a foundation principle of durability and of world security.

JOHN BARTRAM AND HIS TREES

A Glimpse Into the Oldest Botanic Garden in America

By HARRY STANTON TILLOTSON

A FEW years ago, while strolling through John Bartram's garden in the outskirts of Philadelphia, I was approached by a young man carrying a camera. He was seeking information about the ancient shrubs and trees in this oldest botanic garden in America, and as we talked he expressed amazement that so few visitors were present.

He had come from California and was visiting Philadelphia for the express purpose of seeing the surviving specimens of plants collected by "the father of American botany." He seemed to appreciate, more than many easterners, the charm of this quaint and interesting place which in days past attracted such men as Washington, Jefferson and Franklin.

Here on the once beautiful bank of the Schuylkill River, the Quaker botanist of the eighteenth century built his home and established his nursery of rare plants. The tract of land in a section then known as Kingsessing, was purchased at a sheriff's sale in 1727. Some of the ground was low and swampy. This was laboriously drained and graded for cultivation and was probably the first instance of land reclamation undertaken in the new world.

Born of Quaker parents at Darby, Pennsylvania, in 1699, John Bartram early became interested in the study of medicine and in the habits of the plants from which certain remedies were derived. Resolved to lay out much of his new possession as a botanic garden, he began, the year after its purchase, to collect native shrubs and trees as well as exotics which might be acquired through exchange from European collectors.

There was a small house on the grounds and with this as a nucleus, Bartram built of native stone the sturdy dwelling that has survived to the present day. Married to Mary Maris in 1723, he was left a widower four years later. Two children were born of his union. In 1729, Ann Mendenhall became his wife and eventually the mother of nine children.

Ann did not take kindly to her husband's botanical ambitions, pointing ut what she believed to be the greater importance of prosaic farm work with its substantial income. Nevertheless, through dealings with foreign collectors, Bartram gradually built up an extensive and profitable business.

He corresponded with Linnaeus, Gronovius, Peter Kalm and other botanists, and through the efforts of the English horticulturist, Peter Collinson, formed contacts with Lord Petre, Sir Hans Sloane, Philip Miller and others. Collinson, who acted as his agent, once wrote, "Every uncommon thing thou finds in any branch of nature will be acceptable." Roots, plants and seeds were shipped abroad at from five to ten guineas a box. Although these dealings between Bartram and Collinson continued from 1735 to the latter's death in 1768, the two men never met. There existed, however, a high regard for one another.

The versatile statesman, Benjamin Franklin, introduced Bartram to many men of science. To one of these he wrote, "You will find him (Bartram) to be at least twenty folio pages, large paper, well filled, on the subjects of botany, fossils, husbandry and the first creation."

Planted in the Garden in 1735, this fine old Yellowwood still bears its white flowers profusely in the springtime

The substantial stone house Bartram built, seen from the river

The valleys of the Schuylkill and Susquehanna and the woods of Virginia, the Carolinas, Georgia and Florida were carefully explored and yielded specimens that were brought to the botanist's garden. Most of Bartram's travels occurred during the autumn season when farm labors were less exacting. When he found a promising spot he would tie a bell to his horse's neck, turn the animal loose and proceed with his search.

While returning from one of his trips he cut a twig from a bald cypress to use as a horsewhip. Upon reaching home the twig was planted in the garden where it took root and reached a height

of 150 feet before decay caused it to fall a few years ago.

At the southeast corner of the house there stood until recently the remarkable Lady Petre pear tree. It grew from a seed sent from England by Lady Petre and bore its first fruit in 1763, whereupon Bartram wrote to his friend Collinson, "The pear raised from her seed hath borne a number of the finest relished fruit. I think a better is not in the world."

An ancient Trumpet Creeper, still blossoming freely though sent from North Carolina by the botanist's brother in 1749

Toward the end of the career of this venerable tree, the caretaker of the garden gave me a sample of its fruit and I can attest to the fine flavor that Bartram had long ago noted. But the tree is no more and the excellent fruit that, strangely, never became a commercial asset, is lost to posterity.

In 1765, Bartram was appointed Royal Botanist and received the following notification from Peter Collinson: "I have the pleasure to inform my good friend that my repeated solicitations have not been in vain for this day I received certain intelligence from our gracious king that he had appointed thee his botanist with the salary of £50 a year."

Many of the rare trees and shrubs carefully nurtured by Bartram succumbed long ago to neglect and unwholesome conditions due to the inroads of commercialism. Smoke from passing railroad trains and oily refuse that litters the once beautiful river bank have led to the death of many fine specimens. Among these was the famous Bartram Oak, *Quercus heterophylla*, that bore leaves of various shapes. Nevertheless, the garden, a part of the park system of Philadelphia since 1896, still contains a number of the plants established there two centuries ago.

A recent checkup shows that there still remain old specimens of the yellow buckeye, willow oak, hackberry, tulip tree, Kentucky coffee tree and cucumber tree. Between the house and the river is a giant maidenhair tree, *Gingko biloba*, from China. It is probably one of the oldest of its race in the western hemisphere. Of the original species brought to the garden are also to be seen the American hornbeam, various oaks and maples, and the lovely silverbell tree.

On one of his southern trips, Bartram with his son, William, who also became a noted botanist, discovered a magnolia-like shrub on the bank of the Altamaha River in Georgia. It was brought to the garden where it flourished and bore its beautiful creamy-white flowers. Though resembling the magnolia, it blossoms in late summer over a long period. In honor of his friend, Franklin, the botanist named the plant the Franklin tree, or *Franklinia*, though it is now generally classified as *Gordonia altamaha*.

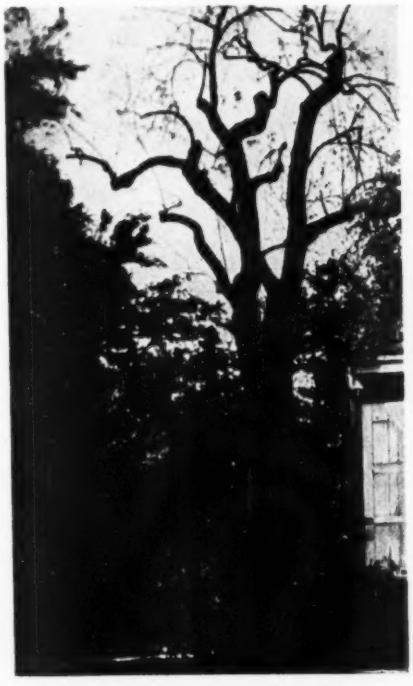
Strangely enough, no other specimen has been found growing wild since 1790, and until quite recently only a few specimens were in cultivation, all being descendents of the original Bartram tree. One of these grows on the campus of the University of Pennsylvania. The *Franklinia* proved extremely difficult to propagate but the discovery of a successful method has caused it to be listed by a few growers. The specimen in Bartram Park, as the garden is now called, is an offshoot from the original tree.

Near the northeast corner of the house is a splendid old yellowwood which still puts on its springtime show of lovely white panicles of flowers. Nearby is a Syrian jujube that bears small, fragrant flowers in June. This tree was planted in 1735. It grows close to the eastern wall of the house, a close companion of the gnarled old English ivy that is said to have been planted soon after the completion of the building.

There are several fine old Turkish boxwoods on the grounds. Most, if not

(*Continuing on page* 89)

The famous Franklinia he brought from Georgia in 1765 and named for his close friend, Benjamin Franklin



Silhouetted against the sky is the remarkable "Lady Petre" pear tree, which first bore in 1763, continuing for 175 years

YOUR SHADE TREES:

SOME UNUSUAL VARIETIES

By L. E. MANNING

THERE seems to be a general impression that shade trees look, on the whole, very much alike. This is only partially true, for there exists one group of trees, quite different from conventional trees as to foliage and branch and even in flower and fruit. With them, unusual and striking effects can easily be obtained. The chief members of this group are the Ginkgo, Bald-cypress and Goldenlarch.

There is good botanical reason for their unusual appearance. All are closely related to the coniferous evergreens—that is, they are among the most primitive forms of tree-life. The Ginkgo was a common tree in America when dinosaurs roamed our plains, and their fossil remains are still to be found in several states—almost exactly the same species that still exists today. They do not look quite so odd as that may sound, but they are unusual and interesting both to look at and to talk about.

Merely because trees happen to be different would of itself be a poor reason for recommending them. But the three mentioned are really beautiful and attract favorable attention at first sight. Likewise, they are extremely practical and perfectly hardy throughout most of the United States. Nor is that all, for they possess in common the unique and comfortable virtue of being immune to ordinary insect pests. The cause of this immunity seems to be not only a resistance to many diseases, but an actual power to repel insects. The leaves of the Ginkgo, for instance, used to be placed between leaves of books in China centuries ago to prevent damage by bookworms. Modern science, of course, finds present-day chemicals much more efficient.

The beautiful fan-like leaf and fruit of the Ginkgo

A handsome specimen of the Ginkgo, or Maidenhair tree,—on Long Island, deservedly widely popular as a shade tree

The Ginkgo, or Maidenhair tree. (*Ginkgo biloba*) is becoming better known and more widely planted every year as a shade tree for city streets because of its tolerance for almost any kind of soil and its ability to survive impure air and smoke with no apparent loss of vigor. An old specimen sometimes reaches 100 feet in height, but its spread is not so enormous nor its shade so dense as such a majestic stature would indicate. It has parallel branches—either horizontal or with an upward slope—giving a graceful and unusual appearance. The smallish leaves are shaped like fans, light green in color but turning golden in autumn. Its faults—and every tree has some — consist chiefly of its slow growth when very young, which means that planting-sized trees are more expensive to buy than some other kinds of trees. And Ginkgo is not so readily obtainable as commoner elms and maples. However, when the tree gets to planting size it seems to increase in speed of growth and cannot be rated as a really slow tree over a twenty-year period.

It is well to attempt to purchase only a male tree, though one cannot always make such selection. The female, or fruiting form, drops fruits in late summer. On streets, of course, this is unsightly and the pulpy portion of the fruit decays promptly with an unpleasant odor. To offset this, the bad-smelling pulp once removed, there remains an odorless edible nut three-quarters of

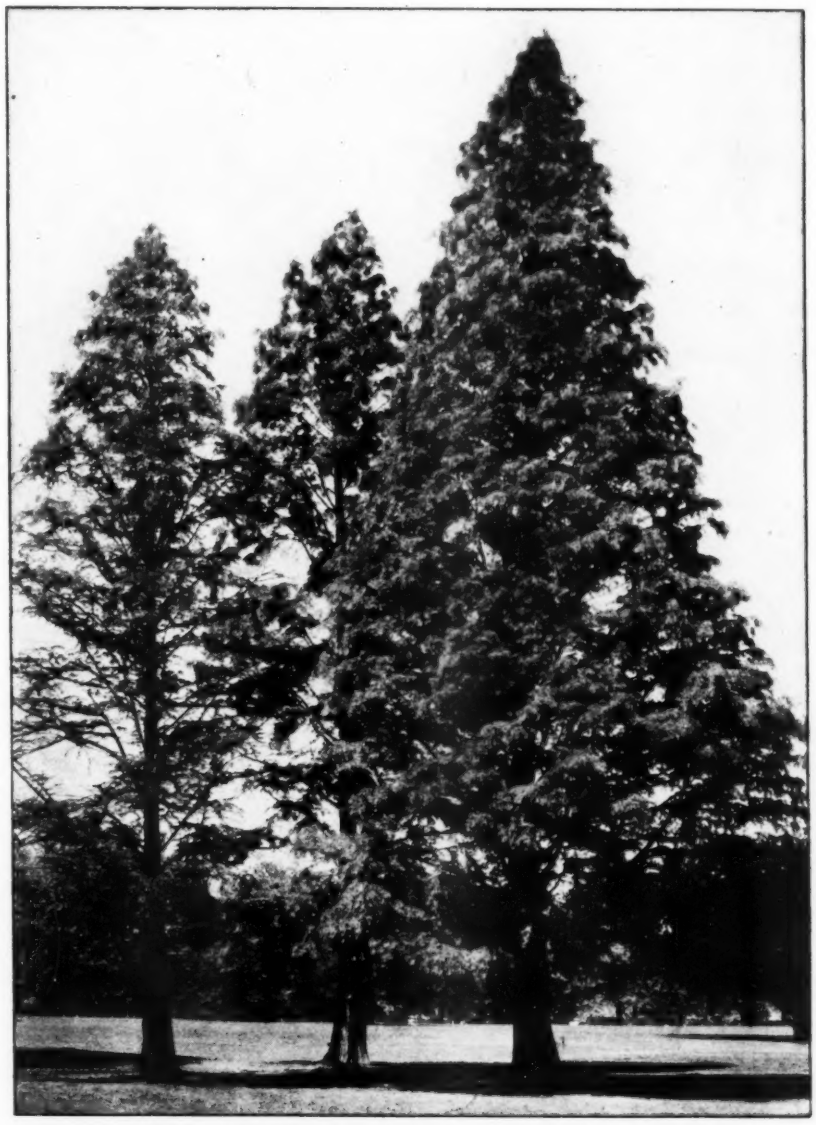
an inch long, with a paper-thin silvery shell enclosing a soft tasty kernel. This nut, roasted, is an important article of commerce in parts of China where, incidentally, it is supposed to aid digestion and help the convivial host keep sober though he drink glass for glass with his guests!

There is a group of plant-lovers prejudiced against using any but native trees in American gardens. True, Ginkgo is not considered a native American, but a few geological epochs ago it *was* one, as has been said—and widely spread over the country, too. But it so existed in many countries throughout the world. Its country of origin would be hard to name. It has been commonly reported to have been found wild in eastern China but Ernest Wilson, the famous plant collector, after many years of investigating such reports, has this to say: "The Ginkgo, statements to the contrary notwithstanding, no longer exists in a wild state and there is no authentic record (even in Chinese history) of its ever having been seen growing spontaneously . . . it is known as a planted tree only and usually in association with religious buildings." He and others have speculated whether it might have been preserved from extinction by prehistoric nature-worship cults and, later, by Buddhist monks. Certainly no other living tree has persisted so long, unchanged, in the world.

The Bald-cypress (*Taxodium distichum*) is a native of eastern America and seldom thought of as a desirable shade tree, though there is no good reason for its neglect. It grows in our southern swamps and only there does it form the strange root-growth known as cypress knees. It is, therefore, natural for the average tree-planter to think of it as a tree for wet land exclusively. The fact is, Baldcypress grows better and faster on dry land than on wet. Any soil but a dry, sandy one seems to satisfy it. Its growth is straight, reaching sometimes — a feathery pyramid with delicate green pluming on its trunk from top to bottom—150 feet high. Growth is rapid and the tree is neither expensive nor particularly difficult to obtain. Like the Ginkgo it is extremely easy-going both at the time of transplanting and thereafter. Singularly free of insects, it has no major faults.

The Goldenlarch (*Pseudolarix amabilis*) has leaves which look quite like those of the larches—the "tamaracks" and "hackmatacks" of our American Indians. Yet it is insect-free, which the Larch is not, and is a highly desirable shade tree, whereas the Larch is only fairly so. It makes a broad 100-foot, straight-backed pyramid, its lower branches drooping and its upper branches ascending. It is not so tolerant as to soil and air as the two already described but prefers open, sunny, sandy locations free from lime-stone. The light green needles turn rich yellow-gold in early fall—a spectacularly beautiful sight from which the tree takes its common name. There is only one major fault and that is its rarity. This could be overcome were it better known and in larger demand from commercial growers. It grows slowly in youth and few nurseries stock it at all. If it could be grafted satisfactorily or grown from cuttings it would be more common, but grafted plants (grafted on Larch) are short-lived and cuttings do not root readily. By all means put it on your list of trees you would like to obtain if chance offers.

The desirability of an unusual tree is apparent to all who have unusual planting problems to meet. But more than that, strangeness acts as a tonic upon the imagination. Things too familiar lose some of their intrinsic interest from mere custom. These reasons may cause you to consider using the three trees described here for your own planting. But beyond that, it is interesting to remember that Nature arranges for the survival and evolution of life by her enormous diversity. Not impossibly in the future some violent epidemic or climate change might wipe out most tree life. And among the survivors might once again be these unusual three — which have already survived so much of geological change.



The Baldcypress, most desirable as a shade tree for it has no faults and grows better and faster on dry land than on wet

TREE TRAILS . . .

A REPORT ON AMERICAN BIG TREES

WHEN, two years ago, The American Forestry Association, in cooperation with many interested citizens, set out to discover the largest remaining specimens of native American trees, but one champion had been definitely recorded. It was a great sequoia, known as the General Sherman Tree, in Sequoia National Park, California. This giant, with a circumference of slightly more than 101 feet, and towering 272 feet above its vast root system, was officially accepted as the largest tree in the country.

It still is—and will continue to be until some misfortune sends it crashing earthward. After that sad day another sequoia will take its place as king, for in any consideration of big trees this magnificent family of giants stands alone. Even the mighty redwood, closely related as it is, cannot approach the sequoia in size—or age. The largest redwood so far reported is on the property of the Hammond Lumber Company in Humboldt County, California, a noble specimen sixty-two feet, eight inches in circumference, which raises its topmost boughs 308 feet into the sky.

King of the redwood giants,—in Humboldt County, California

These are the true giants of America —the sequoias and the redwoods. But after these what? How nearly is their great size approached by the lesser kings —the oaks and pines and cedars and firs? The answer might amaze you. On the basis of reports received by the Association up to December 31, 1942, the ten largest trees so far discovered, excluding sequoia and redwood, are as follows:

Top honors go to a giant arborvitae, or western red cedar, in the Olympic National Park, Washington. This giant has a circumference, four and a half feet above the ground, of sixty-two feet, eight inches, identical to that of the largest known redwood. It is, however, only 100 feet high.

Second and third honors go to Douglas firs. The largest of these, with a circumference of fifty-three feet, four inches, towers 221 feet above Queets River, Olympic National Park, Washington. The other giant, on the property of the Hawley Pulp and Paper Company, near Seaside, Oregon, is forty-eight feet, nine inches in circumference. Its height is 210 feet.

Number 4 on this list is a great eastern sycamore, forty-two feet, seven inches in circumference, standing on the bank of the Muskingum River, near Beverly, Ohio. A giant baldcypress near Stanford, Florida, follows with a circumference of forty-two feet. Next is a Sierra juniper in the Stanislaus National Forest, California, forty feet, eleven inches in circumference. A western red cedar, this one with a circumference of thirty-nine feet, four inches, and located in the Clearwater National Forest, Idaho, claims Number 7 position.

This is followed by a coast live oak, thirty-eight feet in circumference, near Gilroy, California; a canyon live oak in the Angeles National Forest, California, with a circumference of thirty-six feet,

three inches; and a live oak, thirty-five feet in circumference, near Hahnville, Louisiana.

These are the aristocrats among the tree giants. But there are others, so massive that they stagger the imagination. Consider the familiar oak: A swamp chestnut oak near Sandhill, Mississippi, boasts a circumference of thirty feet, three inches; a magnificent white oak at Wye Mills, Maryland, is twenty-seven feet, eight inches in circumference; a black oak near Millbrook, New York, twenty-four feet, nine inches; a bur oak, with a circumference of twenty-three feet, eight inches, stands near Warsaw, Indiana.

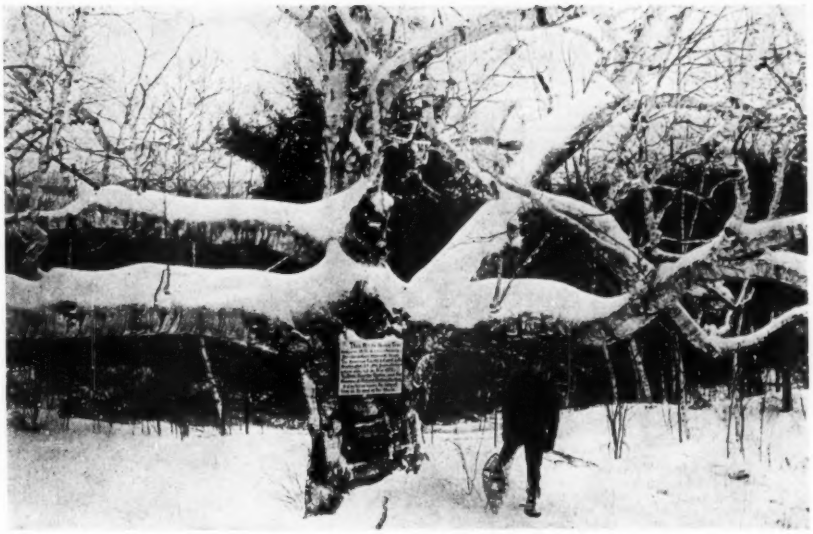
King of the pines is a massive sugar pine, thirty-one feet, eight inches in circumference, in the Stanislaus National Forest, California. It is 200 feet in height. A giant ponderosa pine near Lapine, Oregon, has a circumference of twenty-seven feet, a western white pine in the St. Joe National Forest, Idaho, twenty-four feet, seven inches. The largest southern pine reported is a loblolly, sixteen feet, seven inches in circumference, near Carmichael, Maryland.

Among the maples, the largest reported is a silver near Harbor, Maine. It has a circumference of twenty-two feet, ten inches.

The great American elm at Weathersfield, Connecticut, is king of its clan, with a circumference of thirty feet, three inches.

Among the hickories, a mockernut near Loch Raven, Maryland, with a circumference of eleven feet, nine inches, is the largest reported. The champion holly, eleven feet in circumference, is on Hog Island, near Jamestown, Virginia. A great old tuliptree at Annapolis, Maryland, is twenty-six feet.

A white birch near East Northfield, Massachusetts, claims a circumference of eighteen feet; a yellow birch in the Green Mountain National Forest, Vermont, one of thirteen feet, nine inches. An American beech at Cannon, Delaware, is fifteen feet, ten inches in girth.



Champion white birch near East Northfield, Massachusetts

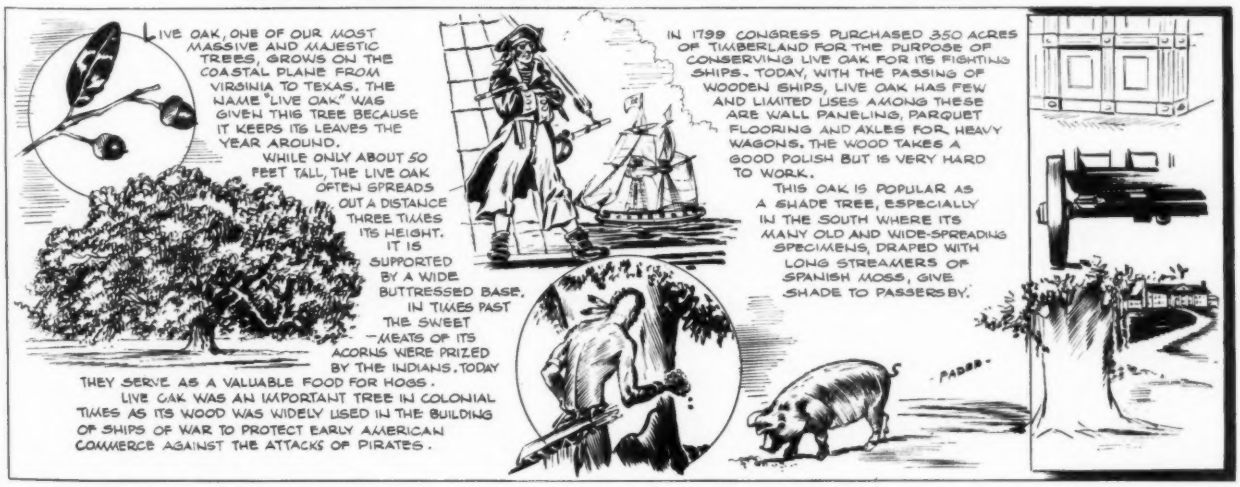
The largest spruce is a bigcone, twenty-one feet, seven inches in circumference, in the Angeles National Forest, California, though an Englemann in the Flathead National Forest, Montana, measures nineteen feet, four inches. A giant incense cedar in Yosemite National Park, California, is twenty-eight feet in circumference; a northern white cedar at Natural Bridge, Virginia, fifteen feet, six inches.

A red gum in South Carolina is twenty-one feet, four inches in circumference; a black gum in Maryland eighteen feet, two inches. Maryland also claims the largest black walnut, nineteen feet, nine inches.

A white ash, eighteen feet, five inches in circumference, is in Ohio; so is a boxelder fourteen feet, eight inches. Wisconsin has the largest eastern cottonwood, twenty-seven feet, two inches in circumference; the king of the western cottonwoods, twenty-nine feet, eight inches, is in Wyoming. The largest chestnut, twenty-seven feet, three inches, is in Tennessee; the largest sassafras, seventeen feet, two inches, in Ohio.

These are but a few of the kings along the tree trails of the nation. A list of the largest of nearly 200 different species—that is, the largest reported up to December 31—may be obtained by writing The American Forestry Association, 919 Seventeenth Street, Northwest, Washington, D. C.

TREES AND THEIR USES—No. 72—LIVE OAK


LIVE OAK, ONE OF OUR MOST MASSIVE AND MAJESTIC TREES, GROWS ON THE COASTAL PLANE FROM VIRGINIA TO TEXAS. THE NAME "LIVE OAK" WAS GIVEN THIS TREE BECAUSE IT KEEPS ITS LEAVES THE YEAR AROUND.
WHILE ONLY ABOUT 50 FEET TALL, THE LIVE OAK OFTEN SPREADS OUT A DISTANCE THREE TIMES ITS HEIGHT. IT IS SUPPORTED BY A WIDE BUTTRESSED BASE.
IN TIMES PAST THE SWEET-MEATS OF ITS ACORNS WERE PRIZED BY THE INDIANS. TODAY THEY SERVE AS A VALUABLE FOOD FOR HOGS.
LIVE OAK WAS AN IMPORTANT TREE IN COLONIAL TIMES AS ITS WOOD WAS WIDELY USED IN THE BUILDING OF SHIPS OF WAR TO PROTECT EARLY AMERICAN COMMERCE AGAINST THE ATTACKS OF PIRATES.
IN 1799 CONGRESS PURCHASED 350 ACRES OF TIMBERLAND FOR THE PURPOSE OF CONSERVING LIVE OAK FOR ITS FIGHTING SHIPS. TODAY, WITH THE PASSING OF WOODEN SHIPS, LIVE OAK HAS FEW AND LIMITED USES AMONG THESE ARE WALL PANELING, PARQUET FLOORING AND AXLES FOR HEAVY WAGONS. THE WOOD TAKES A GOOD POLISH BUT IS VERY HARD TO WORK.
THIS OAK IS POPULAR AS A SHADE TREE, ESPECIALLY IN THE SOUTH WHERE ITS MANY OLD AND WIDE-SPREADING SPECIMENS, DRAPED WITH LONG STREAMERS OF SPANISH MOSS, GIVE SHADE TO PASSERS BY.
PADDY

LIVE OAK

***Quercus virginiana*, Miller**

By G. H. COLLINGWOOD

THE massive live oak is one of the most impressive and majestic trees of the south Atlantic and Gulf Coast states. It is found on the coastal plain from southeastern Virginia to the tip of Florida and along the Gulf Coast to Mexico reaching inland as far as the Red River Valley, and the westernmost tip of Texas. It is also found in the mountains of Cuba, southern Mexico, and Central America.

The live oak in its best known form is a dense round-headed tree seldom more than fifty feet tall with a massive trunk three or four and rarely seven feet in diameter above its swollen and buttressed base and divided a few feet from the ground into two or more large spreading limbs fifty to seventy feet in length. Though seldom attaining more than sixty feet in height, the width of branch spread is sometimes as much as three times greater. It reaches its best development and largest size on rich hummocks and ridges a few feet above sea level from the Atlantic to the east Gulf coast. In sandy barren soil near the seacoast and on the shores of salt water bays it attains the proportions of a shrub sometimes bearing acorns when only a foot high. Westward from the coast of Texas it often forms the principal part of the shrubby growth on low, moist soil.

The name live oak has been given this tree because it retains its leaves throughout the year. They remain about thirteen months on the tree before being pushed aside to make room for new ones. The evergreen leaves are usually elliptical or egg-shaped, and are borne on short, stout stalks. They are two to five inches long, and a half to two and a half inches wide. Most of the leaves have entire margins slightly rolled under, wedge-shaped bases, and rounded tips; but occasionally leaves occur with a few teeth beyond the middle, and a sharp pointed tip. They are shining dark green above, whitish and downy beneath, and when the new leaves appear toward the end of winter those of the previous season turn brown and drop off. A thick, and a thin-leaved form is recognized, although the thin-leaved form is the most widely distributed, and includes nearly all the large live oak trees. The leaves of this form are only slightly curled on the margins, while those of the thick-leaved form are conspicuously curled on the edges.

Live Oak is often much broader than high with long, spreading limbs, massive trunk and a rounded crown of small evergreen leaves

Flowers appear in March or April, the yellow pollen-bearing ones in hairy catkins two or three inches in length; the acorn-producing ones in spikes on slender, hairy stems.

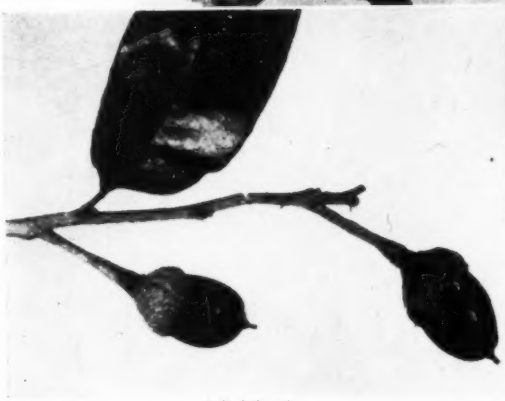
Acorns of the live oak are egg-shaped, shiny, dark, chestnut-brown, about an inch long and one-third of an inch thick. They are enclosed for about one-fourth of their length in a top-shaped, light reddish brown cup, whose inner surface is matted with fine hairs.

Three to five, occasionally one or two, acorns grow on the stout, downy, light brown stalks which are one to five inches long. Because of their sweet meat, live oak acorns were gathered and eaten by the Indians. Today they afford valuable food for hogs.

Bark on the trunk and large limbs is dark brown tinged with red, and is from one-half to an inch thick. It is slightly furrowed, breaking at the surface into small tight scales. The slender rigid branchlets are light gray or brown, and are downy through the first winter, but become darker and smooth the following season.

O. G. Babcock

Flowers appear in March or April after the new leaves which are shiny above and downy beneath with edges turned under



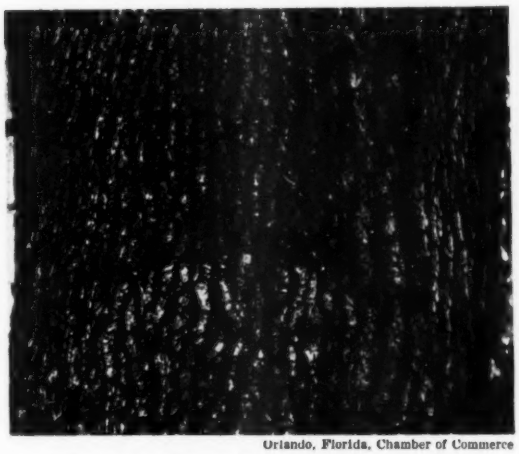
J. R. Dilworth

The shiny, dark brown, egg-shaped acorns are held by light reddish brown scaly cups on long stalks

The wood is light brown or yellow with thin nearly white sapwood, and is hard, strong and tough. It is close-grained and very heavy, a cubic foot weighing nearly sixty pounds. It takes a fine polish, but is difficult to work. Before 1860 when all ships were made of wood, live oak was used extensively in shipbuilding. Especially important was it for ships' "knees." These were cut from the portion where the junction of large roots with the base of the trunk forms a natural "knee," so that the interwoven grain makes it far stronger than a similar piece of wood carved from a straight timber. Live oak "knees" are occasionally used in shipbuilding today. Except for fuel its present uses are few and limited. Occasional mention is made of live oak for wall panels, parquet flooring, and as axles for heavy wagons.

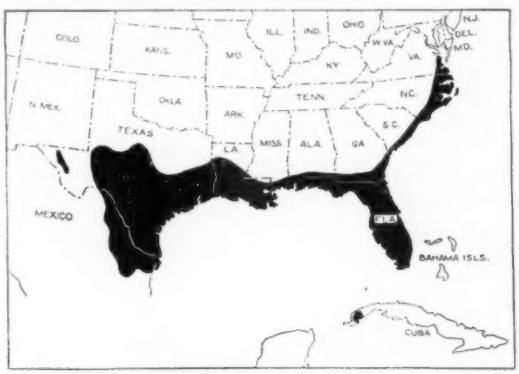
Because it is readily transplanted when small, and grows rapidly, and because its gnarled, spreading, picturesque branches give shade, the live oak has long been popular as a shade and ornamental tree in the South. Today there are many large, old specimens and impressive avenues of these sturdy trees. In the more southerly part of its range, the limbs are draped with thick veils of gray Spanish moss, giving it a weird picturesque appearance.

Live oak bears the distinction of being the first North American tree to be conserved for future use in a forest preserve. The value of its wood for shipbuilding was brought to the attention of Congress because of the need for ships of war to protect American commerce against pirates, and three hundred and fifty acres of live oak timberland was purchased in 1799. By 1845 the Government had obtained over a quarter of a million acres of live oak land in five southern states. With the passing of wooden ships most of this land was turned over to the General Land Office and opened for settlement.



Orlando, Florida, Chamber of Commerce

Bark on mature trunks and large limbs is dark brown and furrowed into small tight scales



Natural range of Live Oak

"WE QUOTE" . . .

KARL T. FREDERICK

From Address before the New York State Conservation Council, Inc., at Binghamton, on December 5, 1942

CONSERVATION IN A WAR WORLD

THE most important fact of life at the present time, and for a more or less indefinite period of the future, is the war and its effect on conservation and the place of conservation in a war world.

I have occasionally seen what seemed to me to be wicked statements, some of which appeared to emanate from responsible sources. I have read of people who have appeared to recommend that we should now, because we are at war, slaughter our vast herds of big game for purposes of food.

We have been told, and it is true, that migratory wildlife—ducks and geese—have enjoyed an amazing comeback. This is due to a happy combination of climatic conditions together with a great national program of restoration and management. Probably our migratory population is greater today than it has been within a generation.

Yet, with this encouraging outlook, I have heard people say, "Now, isn't that grand! We can kill all the ducks and eat them and save food for the boys on the fighting line."

Then there are the forests. The demand on this resource is probably greater than it has been at any time in the past. So are the dangers from fire, insects and disease. But the greatest danger is that future needs may be forgotten, sound forest practices abandoned, and our forests ruthlessly and unnecessarily destroyed under the slogan of "war needs," when in fact the war requires no such sacrifice and when the wasteful destruction is due to hysteria or greed.

The problem, as I see it, is—what is the sound point of view with respect to these resources in the light of this great national emergency? I think it is clear. I think that war is not in itself the chief objective or purpose of life. We do not regard this war as, in itself, the object for which we have been building and living. We look upon it as a great and tragic evil, like disease, which must be endured and fought and survived. The normal and desirable objective of the human race is the establishment of peace and a life at peace, just as the normal and desirable condition for us as individuals is a healthy condition of our bodies and minds.

Therefore, we must, it seems to me, pay attention to those values which will contribute to our welfare, our happiness and existence when peace comes again.

What are the values for which we are fighting? They may, perhaps, be summed up in this—that we, as American citizens, are fighting for the protection and perpetuation of our way of thinking and our way of living. We do not want to submit to domination and dictation from foreign powers or foreign ideas, ideals, or ideologies which are not agreeable to us.

You may say it is a strife of "wants." We want what we want. And we are going to fight for it. That is human nature and it is all right. But when we are through fighting, are we going to have left that for which we have fought? If we have nothing left at the end of the war, it will not matter much whether we win or lose. The one will be as disastrous as the other.

The earth and the stuff of which it is made, and the materials which it produces, go to make up, from a material standpoint, all that we are fighting for. Some of those things are not replaceable and that presents one problem in conservation. Others are things which grow out of the earth, from the soil, from the water, from the air, from the sunlight. They are the reproducible natural resources with which this earth has been blessed and which we enjoy. We do more than enjoy them, we depend upon them and we live on them.

We must, of course, from the nature of things, put into this war that which is really necessary to win it. But, the great danger is that we will pour into it all sorts of things which are not really necessary, but which will injure us in their sacrifice.

This, more than any other time, is one for conservation—which means taking care of and using wisely the wealth that we are blessed with. It is no time to abandon the protection of our welfare, our lives, or our property. That doesn't mean that we shall deny the use of this, that, or the other essential in the winning of the war. But it does mean that we must stand like rocks against the attacks of those wolves in sheep's clothing, those looters and vandals who are always ready and willing to take advantage of a troubled situation to despoil the unwary.

Those wolves in sheep's clothing who try to lead us along paths that would be destructive of our welfare and our wealth for ends that they do not disclose but which they disguise and offer us as prescriptions for the "winning of the war," or the "winning of the peace," must be watched and guarded against at every turn. We must be more than ever alert and careful to defend ourselves against ideals, sophistries and proposals of people of that character.

We must do, in substance, what we have been trying to do for the preservation—the conservation—of these great natural elements of public wealth, and at the same time we must fight an enemy from without.

When you come to look at the causes of this war and the inspirations or ideals that lie behind it, they amount to an organized effort to take away from certain people living on the earth that which they have and to appropriate it to the advantage of those who envy them and want what the others possess.

They say that a petty crime is punished by the courts and the criminal is put in jail, but that a gigantic, social crime is a crime of a different category. I suppose this is true. You can't put a nation of one hundred million people into jail. But when pillage on a gigantic social scale becomes the policy of great groups of people, those who are the intended victims must defend themselves or perish.

Some people seem to think that is not the alternative, that losers do not perish. If you cast your mind back over the pages of history, you will see that many a great social group has perished completely and no longer is to be found on the face of the earth. We face those dangers and we cannot, if we win this war, say that we have won it if we have done so at the sacrifice of all of our natural wealth and our resources. For our own life's sake we must carry on. We must stand by with every power and every resource we know and double our activity to defend our reproducible natural resources at home while we prosecute the war abroad.

Watts New Forest Service Chief

Lyle F. Watts, former regional forester at Portland, Oregon, and in recent months an assistant to the Secretary of Agriculture, was appointed chief of the United States Forest Service on January 8. His appointment fills the vacancy caused by the death of F. A. Silcox in 1939. Earle H. Clapp has been in charge as acting chief.

A native of Iowa, the new chief forester received the Bachelor of Science in Forestry degree at Iowa State College in 1913, and in 1928 was granted the professional degree of Master of Forestry. He became associated with the Forest Service in 1913 as a technical assistant in Wyoming. (See Editor's Log, p. 52.)

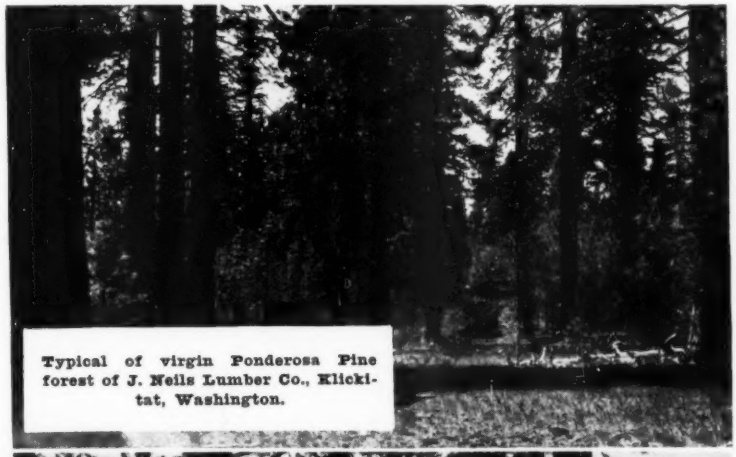
Lyle F. Watts

His experience since then includes all phases of the administrative branch of the Service, from fire guard to regional forester; several years in research as director of the Northern Rocky Mountain Forest and Range Experiment Station; and two years in forestry education, during which time he organized the School of Forestry at the Utah Agricultural College.

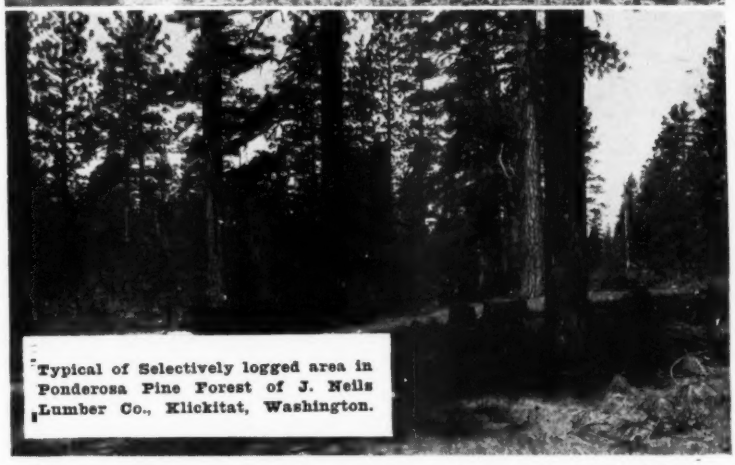
For the past two years Mr. Watts has been chairman of the Department of Agriculture committee dealing with postwar planning for the Pacific Northwest. Last fall he was brought to Washington to assist Secretary Wickard in activities of the Department related to farm labor.

CARE IN CUTTING TIMBER AT KLICKITAT, WASH.

Saves Forest For Future Generations



Typical of virgin Ponderosa Pine forest of J. Neils Lumber Co., Klickitat, Washington.



Typical of Selectively logged area in Ponderosa Pine Forest of J. Neils Lumber Co., Klickitat, Washington.

Only ripe timber is removed, releasing young trees for faster growth. Growth of the young trees under this scientific system will replace within thirty-five years the timber removed by present cutting, assuring a perpetual supply.

J. NEILS LUMBER COMPANY

LE ROY JOHNSON, 295 Madison Avenue, New York, N. Y.
J. C. ROCHE, 647 Midland Bank Bldg., Minneapolis, Minn.
PAUL CURTIS, 308 W. Washington, Chicago, Illinois

MILLS AT KLICKITAT, WASH., AND LIBBY, MONT.

SANDVIK BOW SAWS

MAKE HARD WORK EASY!

SANDVIK BOW SAWS lead in quality and performance, are always dependable and materially assist in reducing operating costs. FRAMES of Seamless Steel Tubing, SAWS made from finest Sandvik Steel, thin back, fast and easy cutting.

Send for Descriptive Folder

Sandvik Saw & Tool Corporation
47 WARREN ST. NEW YORK, N. Y.

CONSERVATION IN CONGRESS

FORESTRY and conservation items received favorable consideration by the President in his $109,000,000,000 "total war" budget for the 1944 fiscal year, sent to the 78th Congress on January 11. With few exceptions, recommendations were comparable to figures for the current year.

In his budget message, the President used a conservation item to illustrate the necessity of maintaining "non-war" expenditures. He said, "Actually, the 'non-war' classification now has little, if any, meaning. Most of these expenditures are related to the war effort and many are directly occasioned by it. This 'non-war' category includes . . . . such items as the control of white pine blister rust. Expenditures for controlling this threat to our timber resources are necessary to avoid possible loss of millions of dollars in lumber from trees which require more than fifty years to reach maturity."

Of a Department of Agriculture budget totaling nearly $1,000,000,000, the Forest Service received $20,242,000 for regular activities, an increase of $57,400 over the current fiscal year. In addition, $56,000,000 is estimated for the emergency rubber project (guayule), as compared with $19,000,000 appropriated in the current year. Maintenance of national forest roads and trails is estimated at $3,778,800, a decrease of $3,221,000.

The white pine blister rust control item received a cut of $2,660 to a total of $1,946,350. Of this amount, the Bureau of Entomology and Plant Quarantine will receive $728,440 for cooperation with the states and private owners; the Forest Service $1,042,990 for control work on national forests; and the Department of the Interior $174,900 for operations on lands under its jurisdiction. Dutch elm disease eradication is estimated at $333,330, a reduction of $23,145 over the current year. The gypsy and brown-tail moth control item was reduced $19,500 to a $363,060 total; forest insect studies and control was reduced $9,980 to a $189,700 total; and forest pathology was reduced $44,360 to $244,100.

Despite the $2,500,000 limit for cooperative forest fire protection as contained in the Clarke-McNary act, the President's budget estimates an expenditure of $3,989,720 for this activity in the next fiscal year. This action is probably based on a precedent set by Congress last year when $4,000,000 was appropriated for distribution to the states and private owners to help protect the nation's forests from fire. No emergency forest fire control estimate is contained in the budget. In the current year, $5,000,000 was made available for emergency fire control in a supplemental appropriation and it may be expected that a similar procedure will be used this year.

Forest products research was reduced $59,720 to a $940,280 total. The Forest Survey item was reduced by $13,230 to $189,400. As the latter item continues to be reduced from the $250,000 legal limit, it becomes increasingly difficult to maintain the Survey in the regions so far covered—the Lake States, the South, and the Pacific Northwest.

National forest protection and management is estimated at $12,826,830, which is $60,380 more than was appropriated for this purpose in the 1943 fiscal year. General administration expenses received a $93,000 cut to $563,670. The forest management research item was reduced $41,600 to a $514,900 total, and range investigations was cut $13,530 to $241,970.

(*Continuing on page* 95)

CONSERVATION IN THE 1943-1944 BUDGET

Appropriation and Project	1944 Budget Estimate	1943 Appropriation
Department of Agriculture		
Forest Service	$20,241,671	$20,184,285
General Administrative Expenses	563,670	573,000
National Forest Protection and Management	12,826,826	12,766,446
Fighting Forest Fires	100,000	100,000
Private Forestry Cooperation	111,942	114,000
Forest Plantation Care	415,000	.....
Research—Forest Management	514,900	556,500
Range Investigations	241,970	255,500
Forest Products	940,280	1,000,000
Forest Survey	189,400	202,629
Forest Economics	112,580	119,000
Forest Influences	125,970	133,000
Forest Fire Cooperation	3,989,723	4,000,000
Emergency Forest Fire Control	.....	5,000,000
Acquisition of Lands for National Forests	100,000	354,210
Soil Conservation Service	22,042,992	22,427,200
Miscellaneous—Department of Agriculture		
Cooperative Farm Forestry, Total	696,168	700,000
Includes:		
Extension Service	106,839	106,839
Forest Service	461,782	386,982
Soil Conservation Service	127,547	202,347
Dutch Elm Disease Eradication	333,330	356,475
White Pine Blister Rust Control, Total	1,946,342	1,949,000
Includes:		
Bureau of Entomology and Plant Quarantine	728,440	730,000
Forest Service	1,042,992	1,044,000
Department of the Interior	174,910	175,000
Gypsy and Brown-Tail Moth Control	363,060	382,570
Forest Insects—Studies and Control	189,700	199,680
Diseases of Forest Trees	244,100	258,460
National Arboretum	38,000	54,892
Naval Stores Investigations	112,100	118,456
Japanese Beetle Control	.....	382,275
Emergency Rubber Project (Guayule)	56,000,000	19,000,000
Department of the Interior		
Fish and Wildlife Service	5,752,365	5,911,570
National Park Service	4,793,000	4,846,020
Grazing Service	978,000	859,800
Soil Conservation—Public Lands	1,300,000	1,340,000
Emergency Forest Fire Control	.....	95,900
O. and C. Lands	290,000	248,750
Prevention of Fires in Alaska	30,000	27,650
Indian Forests:		
General Administration	425,000	381,910
Sale of Timber	145,000	125,670
Suppression of Forest Fires	15,000	15,000
General Public Works		
Roads and Trails—Forest Service	3,778,723	7,000,000
Roads and Trails—National Park Service	.....	179,850
Blue Ridge, Natchez Trace and George Washington Memorial Parkways	.....	269,200
Tennessee Valley Authority (Forestry, Wildlife, Recreational Development)	.....	728,539

John Bartram and His Trees

(*Continued from page* 79)

all, of these were sent to Bartram by the Earl of Bute and are perhaps the oldest of their species in the new world. On a trellis adjoining the old seedhouse is a sturdy trumpet vine that was sent from Cape Fear, North Carolina, in 1749.

In the work of caring for his beloved garden, Bartram was assisted by numerous slaves to whom he paid regular wages and treated with kindness.

In early life, Bartram dissented from some of the accepted tenets of the Quakers and over the door of his greenhouse, long since demolished, he inscribed these sentiments, quoting Alexander Pope: "Slave to no sect, who takes no private road, but looks through Nature up to Nature's God." Under a window in the eastern exposure of the house may be read the following: "It is God Alone, Almity Lord, The Holy One, By Me Ador'd, John Bartram, 1770."

Bartram died in the old house on September 22, 1777, and his son, William, came into possession of the property and carried on the work of his illustrious father, making many valuable additions to the garden's collection. In recent years, largely due to the work of the John Bartram Association, much has been done toward the restoration of this fine old American garden.

Association Elects 1943 Officers

THE annual election of officers of The American Forestry Association was held during December by letter ballot of the membership. W. S. Rosecrans of California was reelected president. William P. Wharton of Massachusetts and Samuel T. Dana of Michigan were reelected Directors to serve five-year terms each. Three new directors were elected to the Board: Bryce Browning, widely known for his conservation work as secretary of the Muskingum Watershed Conservancy District at New Philadelphia, Ohio; Randolph G. Pack of New York, son of the late Charles Lathrop Pack and president of the Charles Lathrop Pack Forestry Foundation; and Colin G. Spencer of North Carolina, president of the North Carolina Forestry Association. George O. Vass, vice-president of the Riggs National Bank, Washington, who has served the Association as treasurer for many years, was reelected to that office. Twenty-one vice-presidents were elected as follows:

Alexander P. Anderson, Minnesota, chemist and inventor; George Alexander Ball, Indiana, Ball Brothers Foundation; Morris Belknap, Kentucky, artist and conservationist; Thornhill Broome, Illinois, Izaak Walton League of America; W. H. Cowles, Washington, "The Spokesman Review"; Aubrey Drury, California, Save-the-Redwoods League; Thomas M. Edison, New Jersey, engineer and industrialist; Mrs. T. M. Francis, Alabama, Chairman of Conservation, General Federation of Women's Clubs; Mrs. Luis J. Francke, New York, Chairman of Conservation, The Garden Club of America; Quintin T. Hardtner, Louisiana, Urania Lumber Company; Edmund Hayes, Oregon, Keep Oregon Green Association; Augustus S. Houghton, New York, New York State Reforestation Commission; D. S. Jeffers, Idaho, School of Forestry, University of Idaho; Elis Olsson, Virginia, The Chesapeake Corporation; H. M. Seaman, Texas, Southern Pine Association; Henry D. Sharpe, Rhode Island, manufacturer; Miss Olive Simes, Massachusetts; Herbert L. Stoddard, Florida, author and wildlife expert; Mrs. Henry Alvah Strong, District of Columbia, Hattie M. Strong Foundation, and Gordon Strong, Maryland.

"The Strongest Geared Power for its Weight in the World"
Two Speeds
Positive Internal Brakes

COMPACT
POWERFUL
SAFE

For Use Where Power is Not Practical, Available, or Sufficient

Two Ton "Lightweight"—Weight 60 lbs.
Five Ton "General Utility"—Wt. 110 lbs.
Fifteen Ton "Special"—Weight 680 lbs.

Positive internal brake—Two quickly shifted speeds — Adjustable length crank handle — anti friction babbitt bearings—Spring operated safety dog. Only eight parts. No keys or set screws to strip. Drum instantly free spooled for running out cable.

Complete descriptive literature and list of dealers in principal U. S. and foreign cities gladly mailed. Warehouse stocks for dealers supply—Seattle, Chicago, Brooklyn, Houston.

BEEBE BROS.
2728 6th Ave. S. Seattle, Wash.

YOUR WAR BONDS
WILL
BEAT THE ENEMY!

FOR INVENTORS INVENTION RECORD FREE
Write today for valuable 72-page booklet, "How to Get Your Patent" and "Record of Invention" form—both free.
L. F. RANDOLPH, 586 Columbian Bldg., Washington, D. C.

PACIFIC PORTABLE PUMPERS
FOR VICTORY

Protecting America's natural resources is doubly important during these busy war days.

PACIFIC PUMPERS now being produced by the Pacific Marine Supply Company are going direct to our Armed forces. We know Civilian Fire Protection Organizations will understand if their orders cannot be filled immediately.

As the leader in Portable Pumper equipment development, we gladly offer our facilities to owners and users of fire fighting equipment.

Just drop a card to:

PACIFIC MARINE SUPPLY CO.
FIRE FIGHTING EQUIPMENT DIVISION
SEATTLE, WASHINGTON

THE CONSERVATION OF NATIONAL RESOURCES, by George T. Renner. Published by John Wiley and Sons, Inc., New York, N. Y. Illustrated. 228 pages. Price, $2.75.

This is a democratic study of national resource planning and conservation. The general outline of the problems in connection with each major classification of resources and analysis of possible remedies present a tangible medium for student instruction. Questions of a controversial nature are listed at the end of each chapter, and the student will need to develop his theories with a wide range of facts.

Planned to meet the needs of students in teachers colleges, normal and university schools, this book will serve as a useful guide and teaching manual for instructors.

TEXTBOOK OF DENDROLOGY (Second Edition), by William M. Harlow and Ellwood S. Harrar. Published by McGraw-Hill Book Company, Inc., New York, N. Y. Illustrated. 542 pages. Price, $4.50.

In this new edition, the authors have included range maps and paragraphs dealing with the botanical features of 300 American trees dealt with in their first book of the same title, which was added to the McGraw-Hill authoritative American Forestry Series in 1937.

This book serves as a reference as well as a textbook to a greater understanding of trees. An important feature of this "Textbook of Dendrology" are the photographs of bark, leaves, fruit, and details of tree-blossoms and buds.

CHEMICAL GARDENING, by D. R. Matlin. Published by the Chemical Publishing Company, Inc., New York. Illus. 163 pages. Price $2.25.

Those interested in the soilless culture of plants will find the newest methods described in "Chemical Gardening." The simple instructions can be practiced by the inexperienced as well as the trained with equal success.

CRUSADERS FOR AMERICAN LIBERALISM, by Louis Filler. Published by Harcourt, Brace and Company, New York. 422 pages. Price, $3.50.

An interesting and informative story of the popular movement which began some thirty years ago to expose graft in high places and to reform the American system is here told by Mr. Filler. The time of which he writes were the "muck-raking" days ushered in by the present century. The men and magazines which formed the storm troops of this crusading movement are described by the author in a factual and human style that holds the reader from beginning to end.

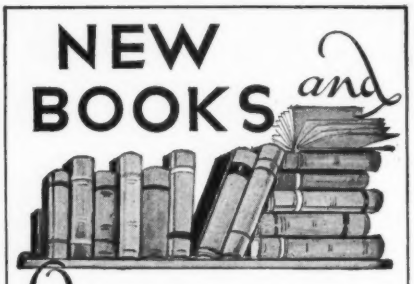
Of special interest to conservationists is the chapter on "The Ballinger Case." As the title suggests, these pages review events and personalities which effected Mr. Ballinger's resignation as Secretary of the Interior and the fall of the Taft administration. It is a chapter which all conservationists would do well to read.

PRINCIPLES OF FOREST ENTOMOLOGY, by Samuel Alexander Graham. Published by McGraw-Hill Book Company, Inc., New York. Illustrated. 410 pages. Price, $4.00.

Dealing almost entirely with the insects which have a direct effect upon living trees and upon forest products, including also those species of insects which are predaceous or parasitic upon tree pests, this book offers a thorough discussion of the outstanding phases of forest entomology. In eighteen chapters it covers such topics as environmental resistance, insect abundance, direct control of tree insects, leaf-eating insects, wood destroyers, sap-sucking insects, and so on. Throughout there is much on the economic side of the subject as it relates to forestry, and the latest methods of forest pest control are reviewed. At the end a section titled, "A Glimpse into the Future," gives a brief summary of what may be in store for the forest entomologist in years to come.

SONGS OF A WOOD HICK, by Clayton Spicer. Published by the Oquago Press, New York, N. Y. Illustrated with line drawings. 48 pages. Price, $1.50.

Mr. Spicer has set in rhythmic prose a fund of entertaining tales of the woods country. As one who has shared years of labor and pleasure in lumber camps, the author writes with understanding and deep affection of the forest and those who shared his lot as a woodsman.



A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Economic Aspects of Recreational Land Use in the Lake of the Ozarks Area, by J. Roger Snipe and Conrad H. Hammar. Univ. of Missouri, Coll. of Agr., Bull. No. 448. Agr. Expt. Sta., Columbia, Mo.

Care of Damaged Shade Trees, by Rush P. Marshall. U.S.D.A., Farmers' Bull. No. 1896. Supt. of Docs., Wash., D. C. Price 15 cents.

Dendrochronology in Northern Alaska, by J. L. Giddings, Jr. Univ. of Arizona Bull. 12, No. 4; Laboratory of Tree-Ring Research Bull. No. 1. Univ. of America, Tucson, Ariz.

Convention and Documentary Material on Nature Protection and Wildlife Preservation in the Western Hemisphere. Division of Agricultural Cooperation, Pan American Union, Washington, D. C.

A Primer on the Chemical Seasoning of Douglas Fir, by W. Karl Loughborough, and *Plastic Wood,* For. Prod. Lab., For. Serv., U.S.D.A., Madison, Wis.

Relation of Naval Stores Yields to Frequency of Chipping, by T. A. Liefeld. Reprinted from "Journal of Agricultural Research," Vol. 64, No. 2. Supt. of Docs., Wash., D. C. Price 5 cents.

Equipment and Methods for Harvesting Farm Woodland Products, by C. J. Telford, For. Serv., U.S.D.A., Farmers' Bull. No. 1907. Supt. of Docs., Wash., D. C. Price 5 cents.

Diseases of Forest-Tree Nursery Stock, by William C. Davis, Ernest Wright and Carl Hartley. Federal Security Agency, Civilian Conservation Corps, For. Pub. No. 9. Supt. of Docs., Wash., D. C. Price 20 cents.

The White-Necked Raven in Relation to Agriculture, by Shaler E. Aldous. Research Report, No. 5, Fish & Wildlife Service, U. S. Dept. of Int. Supt. of Docs., Wash., D. C. Price 10 cents.

How to Cut Wood With Less Labor and *How to Burn Wood,* Wartime Edition. Published by the Connecticut Forest and Park Association, 215 Church Street, New Haven, Conn.

American Forests, published for free distribution to schools, by American Forest Products Industries, Inc., 1319 Eighteenth Street, N. W., Wash., D. C.

The Peats of New Jersey and Their Utilization, by Selman A. Waksman. Board of Conservation and Development, State House Annex, Trenton, N. J.

Trees of Puerto Rico, by L. R. Holdridge. For. Serv., U.S.D.A. Tropical Forest Occasional Paper No. 1, Rio Piedras, Puerto Rico.

Vegetable Oil from the Amazon

(*Continued from page 62*)

mission, are oil producers, though to a lesser degree. Their contribution to present and future needs will depend upon the rate and extent of development.

The same thing may be said about that little known treasureland 2,400 miles up the Amazon—the Oriente of Ecuador and Peru. This remote and vast storehouse of resources, described in the September issue of AMERICAN FORESTS, awaits only development to contribute its many riches to the winning of the war and to post-war reconstruction. An empire of more than 150,000 square miles of tropical forests, jungles and waterways, the Oriente holds millions of cubic feet of timber, much of it with great commercial possibilities. So does it hold countless trees chiefly valuable for their resources of oil and fiber.

Certain palms of the Oriente, different in many respects from those in the lower Amazon basin, are prolific oil producers. They are known and used in a primitive way at the small settlements that fringe the rivers, the latter the only highways in this vast country. If modern methods and equipment were applied to these oil-bearing seeds and nuts, their contribution to the vegetable oil needs of our hemisphere would be great.

One of these palms, the chambira, occurs in great numbers along the Amazon itself as well as its tributary streams. Its yellowish fruits, large as eggs, yield forty per cent of excellent oil, suitable for all culinary purposes. At the same time, its leaves produce a fiber which the Indians use for many purposes. It will make rope which is stronger and more durable than hemp. Brazil exports chambira fiber under the name of "tacunu."

Around Iquitos, Peru's main Amazon River port, which can be reached by ocean-going vessels, a tall palm, the hunguragua, is found in abundance. Its fruit grows in large clusters, each fruit as large as a prune, and in Iquitos its oil is extracted by decoction. It is of very high quality and could well be used as a substitute for olive oil. Farther east, in the Brazilian part of the upper Amazon Valley, the exploitation of this excellent oil is much more advanced than in the Oriente regions, and that country exports considerable quantities of it.

The javari, or yarina, a common palm on river terraces, especially between the Huallaga and Maranon rivers, produces nuts which contain not less than thirty-seven per cent of fats. Oil is also obtained from its wood pulp. When ripe, javari nuts are extremely hard and for this reason, as well as for their whiteness, are known as ivory or tagua nuts.

This palm grows practically without a trunk and the fruits are formed at its base, close to the ground. Each fruit contains a number of nuts of triangular shape, the size of large chestnuts. When ripe they are principally used in the manufacture of buttons and carved trinkets, especially rings, earrings and amulets. In Colombia a number of modern tagua factories turn out ivory-nut buttons in great quantities for local and export sale.

This Oriente palm grows pretty much to itself, crowding out almost all other vegetation, and where its growth is abundant it is sure proof that the soil is well watered and very fertile.

The fruit of one of the huicungo palms of the Oriente, all of which are clothed with spines, has an oil content of about forty per cent. That of the inchavi contains up to sixty-seven per cent of good oil. One of the most beautiful palms of this little known country is the aguaje, though its hard nuts contain but nine per cent oil. Brazilians call it burity palm, and there, as well as in Venezuela and French Guiana, where it is well known, it has long been put to many uses. Its fan-shaped leaves are particularly valuable as a source of fibers.

The pijuayo, better known to English-speaking people as the peach palm, is cultivated by the natives of the Oriente, and has been from ancient times. It is a slender, graceful tree which proudly raises its crown high over the lower forest. Its fruits, the size of small eggs, grow in large clusters weighing from seventy-five to a hundred pounds. After boiling, the pulp is an excellent food and forms an important winter food supply

GROW XMAS TREES OR FOREST

Write Today for Special Christmas Tree Bulletin and Complete Forest Tree Price List

	Per 1,000
2 yr. American Red Pine	$10.00
2 yr. Austrian Pine	15.00
2 yr. Colorado Blue Spruce	10.00
2 yr. Scotch Pine	15.00

MUSSER FORESTS, Inc.
Indiana, Penna.

Trees for Forest Planting

PINE • SPRUCE

Firs, Arborvitaes and Other Conifers. We raise all our trees in our own nurseries.

KEENE FORESTRY ASSOCIATES
KEENE, NEW HAMPSHIRE

TREES FOR SALE

FOR FOREST PLANTING
Norway Spruce, Red Pine, White Pine, Scotch Pine, White Spruce, Colorado Blue Spruce, etc. Prices are reasonable and the trees are GUARANTEED TO LIVE.
WESTERN MAINE FOREST NURSERY, DEPT. F.
Fryeburg, Maine

YOUR WAR BONDS
WILL
BEAT THE ENEMY!

CHESTNUT TREES

Buy Bearing Blight - Resistant Chinese Chestnuts

Easily grown, heavy yielders. Northern Strains

NUTS IN FOUR YEARS!

Plant for Beauty—Profit—Shade—Nuts—Fun
Send postcard for FREE early Order Offer, Booklet and Prices on 42 var. of Nut Trees. Excellent for ornamental purposes. I have experimented with nut trees for over 46 years.
Sunny Ridge, 442 New St., Swarthmore, Pa.

ATKINS

CROSSCUT SAWS • WIDE BAND SAWS

SAWS
Cutting a Name for Themselves in America's Forests

SOLID AND INSERTED TOOTH CIRCULAR SAWS

E. C. ATKINS AND COMPANY
Indianapolis, Ind.

BUY WAR BONDS AND STAMPS REGULARLY

YOUR INVITATION TO MEMBERSHIP

We extend to you a cordial invitation to participate in the 1943 wartime program of The American Forestry Association which includes:

1. Intensification of present educational and legislative activities to assure the best possible protection of forests from fire, the adoption of improved methods of forest practice, and the avoidance of unnecessary waste, including specifically:

a. Aggressive participation in the campaign of the Association of State Foresters to obtain an authorization under the Clarke-McNary Act of $9,000,000 for Federal cooperation in fire control and of $1,000,000 for Federal cooperation in the control of insects and disease.

b. Vigorous leadership in obtaining constructive State legislation to control cutting on privately owned forest lands.

2. Active promotion of research in the field of forest products, not only by the Federal Government but also by industry and educational institutions.

3. Critical and impartial appraisal of the forest situation, with particular reference to its changing status under war and post-war conditions.

4. Continued efforts to improve "American Forests" with a view to increasing its circulation and its influence.

AMERICAN FORESTS MAGAZINE IS SENT MONTHLY TO MEMBERS

The American Forestry Association,
919 - 17th St., N. W., Washington, D. C.

I hereby apply for membership in The American Forestry Association and enclose $_____.

INDICATE CLASS DESIRED

- ☐ Subscribing Membership $4
- ☐ Contributing Membership 10
- ☐ Sustaining Membership 25
- ☐ Life Membership 100

Canadian Postage 25c extra.

Name_____

Street_____

City and State_____

for the natives. Fermented, it is relished as a drink known as chicha pijuayo. It is quite possible that pijuayo nuts may form an important future industry, for their oil can be compared with the best qualities of such edible oils as coconut and cottonseed. If obtained in sufficient quantities and purity, it would be valuable, for example, in the manufacture of margarine.

In addition to the trees, there are vines which produce oil bearing nuts. These grow in some parts of the Oriente in indescribable abundance, producing oil of high quality. Foremost among these is the habillo, with fruits as large as an oversized orange. They contain a number of flat seeds which have an oil content of forty per cent.

Thus the riches of the Oriente, hardly touched, hardly known, immense in their quantities and in their possibilities of use and application, await the developers. So, indeed, do the riches of all of Latin America—and at a time when they are urgently needed not only by the United States but by its allies.

Vegetable oil is high on the list of these critical materials. That it is fabulously abundant in the great Valley of the Amazon, from the Brazilian delta country to the tropical forests of the Oriente of Ecuador and Peru, is fortunate indeed. So is the fact that the ingenuity and enterprise needed to unlock this vast storehouse are at hand. Programs and agreements are at this moment being negotiated. When this is done, and when shortages of certain machinery needed by the developers are overcome, the oil-bearing forests of the Amazon will make a vitally important contribution to the security and future prosperity of the Western Hemisphere.

The Black Warrior Goes to War

(*Continued from page* 57)

When land was worn out, it was dead until Nature herself could revitalize it. A good southern farmer was one who could boast: "Me? I'm a good farmer. I done wore out four farms a'ready."

Even before the War Between the States, much of this land had already been worked out and abandoned. As early as 1855, many of the plantation owners, having bled the soil of plant vitamins, walked out of their homes and moved away, to other virgin territory. Behind them they left the barren earth to the ravages of the elements.

In walking or riding through the forest today, one stumbles upon those relics of past glory in the form of old chimneys, of houses which are crumbling into dust, of scattered shards in grassy clearings. Many times these clearings are marked by ancient, gnarled apple trees, or crape myrtles, or a lane of cedars through which the family surrey once proudly rolled.

The evacuation of the plateau reached its peak around the turn of the century. Cultivated land, deserted to the winds and rain and sun, washed away, or struggled to grow a protecting blanket of grass and trees.

The change from that period of prosperity and splendor was complete. In 1915, when the Forest Service began its acquisition of land on the Black Warrior, the appraisers found most of the area in small, tax-delinquent farms which had been abandoned by their owners. In many instances they had difficulty in locating the owners at all.

That was the picture of the Black Warrior Forest during the quarter century in which the Forest Service was acquiring some 175,000 acres at the tip end of the Cumberland plateau.

Now this land is coming again into its own. One hundred and twenty-five families will move into the town when it has been completed. There will also be accommodations for between fifty and sixty transient or part-time workers. This labor is to be employed from the residents of local and surrounding areas, with the exception of certain skilled workers who must be imported from the outside.

Let's look for a moment at the economic side of the picture. Let's see what happens when a big sawmill moves in, builds a town and sets up to cut out logs on a perpetual basis by modern methods.

For 175,000 acres of land on the Black Warrior, the Forest Service paid an average of $4.70 an acre. The land was too poor to return to the small farmer enough income to support himself and his family. These farms were listed under an exceedingly low tax rate. Many of them had been tax delinquent for years. As taxable property, they had not paid their way on the county tax books in half a century. Both Winston and Lawrence counties, in which the Black Warrior lies, had carried these acres as a liability rather than as an asset. County officials said this was one of the sore spots of unemployment in Alabama.

Now look at what will happen when the mill begins its operation: The Forest Service says that under the law, twenty-five per cent of all stumpage values must be turned over to the local counties where timber is cut on a national forest. This means that those counties in which the Black Warrior lies, will receive from $5,000 to $7,000 a year in stumpage

values. This is a sharp contrast to the public income from the property while it had been in private ownership.

But tax is not the only benefit the county or its people will receive. Not by the hum of a bandsaw. The payroll of the Grayson Lumber Company will turn approximately $10,000 each month into local trade channels, through the salaries of employees. This payroll will be about half of the gross value of the lumber cut from the Black Warrior, at present lumber prices.

What does this mean? First, that the lumber which comes out of those trees on the Black Warrior National Forest will be sent to feed the war machines to help defeat the Axis powers. The Grayson Lumber Company has war contracts which will take their entire output.

It means that the farmers and other landowners who hold tracts around the big sawmill will also have a substantial market for their logs, which were once sold to the "peckerwood" sawmills.

It means that prosperity will again return to that section of Alabama where owners began to abandon their farm land almost a century ago. There will be a demand for vegetables and eggs and fruits and for the other articles of commerce which go to make up the necessities of life.

It means that many new types of markets will be created, that new business will grow, and that a land which has been practically penniless for generations will come again into its own.

It means that the purpose of one national forest has been fulfilled.

The Santa Lucia Fir

(*Continued from page* 74)

are on San Carpojo Creek, within about two miles of each other. We noted also that western sycamore was growing with the redwood here, a rather unusual association.

As we neared the end of the truck trail, we found Santa Lucia firs clinging tenaciously to the granite cliffs on the northeasterly slopes, although many more grew in the deep cañons and along the water courses below us. The trees were easily discernible by their tall, tapering crowns that ended with spear-like sharpness.

Fortunately, the time of our visit proved to be a cone year, and the tops of the trees were laden with their precious crops. Incidentally, seed-pod collectors lucky enough to own one or more Santa Lucia fir cones consider them among their most prized possessions.

Ranger Paul Case, who is in charge of the Monterey Division of the Los Padres, disclosed that these firs bear cones only every other year. At least his observations, made over a period of several years, have shown no variance in this rule. And apparently the trees do not thrive much below an elevation of about 2500 feet.

Considered the most curious and remarkable of all firs, the Santa Lucia trees, in their natural environment, are restricted to a small, narrow area in the Santa Lucia Mountains scarcely forty miles in length and not over a few miles wide. No other fir in the world has so restricted a habitat. The groves are widely scattered, and the individual number of trees is comparatively small.

The crown of this fir has a singular characteristic form resembling a tall, slender spire, ending in a long, exceedingly narrow and sharp point. This striking feature distinguishes it from its associates, and makes it easily recognizable from a distance of several miles. Its bristly, pitchy cones are borne only in the very summit of the tree.

Dr. Willis Linn Jepson, distinguished California botanist whose studies of the Santa Lucia fir began nearly half a century ago, points out that as a genus it is isolated geographically, no other species of fir being found within 225 miles to the north, 150 miles to the east, and 120 miles northeasterly. The nearest

NEW WOOD BURNING STOVE
Automatic Heat Control

CUTS heating costs . . . burns any kind of wood successfully. New principle of complete combustion greatly increases efficiency — reduces creosote. Large fuel magazine . . . holds even temperature for 12 hours. If your fuel is rationed this Heater will solve your problem. Ask for Folder R.

Cabinet and Radiant Models

RITEWAY PRODUCTS COMPANY
BOX 6-A HARRISONBURG, VIRGINIA

ALL MATERIALS AVAILABLE FOR PROMPT DELIVERY
REGULATION
U. S. FOREST SERVICE
FIELD CLOTHING
- Specified Fabrics
- Expert Tailoring
- Perfect Detailing
- Guaranteed Fit

Write for latest prices and sample fabrics.

THE FECHHEIMER BROS. CO.
Uniforms for Over 50 Years
CINCINNATI OHIO

BARTLETT
COMPOUND LEVER TREE TRIMMERS
Are Standard Everywhere
Available on Priorities
Send for Supply Catalog on Care of Trees
BARTLETT MFG. CO., 3019 E. Grand Blvd. Detroit, Mich.

Nursery Stock

RARE HARDY AZALEAS, RHODODENDRONS, Evergreens, Yews, Flowering Trees, Shrubs, Japanese Maples, Magnolias, Stewartia, Pink Dogwood, 10 to 75 cents each; send for list of 180 RARE PLANTS. Yews in variety, $6.00 for 100. Alanwold Nursery, Neshaminy, Pennsylvania.

Cant Hooks

Bull Dog Grabs

Forged Steel Swivels

Single and Double-Bit Axes—all patterns and weights.
Buy from your dealer, but if he cannot supply you, write us.

WARREN AXE & TOOL CO., Warren, Penna.
SAGER AXES AND BULL DOG LOGGING TOOLS—KNOWN FROM COAST TO COAST

Peavies

known stand of native fir to the south is in the San Rafael Mountains of Santa Barbara County, about 100 miles distant. This is the western white fir, *Abies concolor*.

Trees associated with the Santa Lucia fir in the vicinity of Cone Peak include a few sugar pines, tanbark oak, madroño, bigcone pine, cañon live oak, California laurel, and bigleaf maple.

From the road we branched off on a foot trail and walked the remaining distance to the lookout station along the sheer granite cliffs, a climb of about a thousand feet. And from that vantage point we surveyed the world.

As the Forest Service does not furnish gliders for the downward journey, we started back the way we came—past the majestic Santa Lucia firs, along the narrow cañons clustered with giant redwoods, and thence on down the precipitous face of the mountain to the coast.

At Kirk Bridge, about four miles south of Lucia, we turned south on San Simeon Highway towards San Luis Obispo. In places the road is more than 500 feet above the ocean, and the cliffs drop off precipitously to an almost beachless shoreline.

Then on to San Simeon, San Luis Obispo, Santa Maria and finally Santa Barbara. Thus ended our journey to the native stand of Santa Lucia firs. For the botanist and lover of trees, the trip holds promise of rare thrills and unique adventure. And for the scenery—it's an unforgettable experience.

Elms and the War

(*Continued from page 76*)

Department has been able to develop federally-sponsored state WPA projects.

The expenditure of moderate sums in the isolated areas and at the border of the major region constitutes a practical means of keeping track of the spread of the disease and possibly may prevent its spread or hold it within reasonable bounds. The work in the control areas by the states and the WPA is saving many valuable elms and adding to the life of others. Such work may prevent sudden appearance of great numbers of dead elms in cities and along highways, which would require costly removal as a life-and-property protection measure.

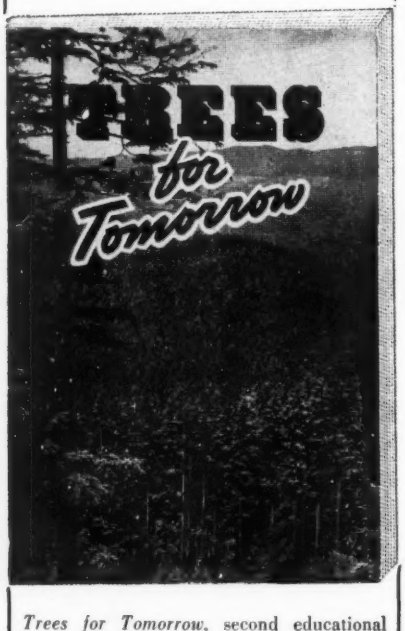
Limited control can be achieved, it is believed, by obtaining information on the location and status of the infected areas, especially in the isolated districts and at the margins of the major region; by continuing eradication efforts in isolated areas where eradication seems more practical under present conditions than mere control; by reducing the rate of spread by finding and destroying disease and insect material at the margin of the major region; by cooperating with state and local efforts to retard the loss of valuable elms in control areas of the major region; and by improving methods for dealing with serious conditions which may develop.

Federal financial support for the campaign continues to come from two sources—regular Department of Agriculture appropriations and allotments of WPA funds. The former are being used principally in the isolated areas and the marginal territory around the major region. The WPA money is being used where security-wage workers are still available and where state projects may be operated. At the beginning of 1942, WPA projects were in operation in seven states. All but three have been terminated or suspended.

Because of increased work areas and a greatly reduced force, methods of operation have been changed. An attempt is being made to build up a permanent scouting force to take the place of the temporary force employed in past years. Scouting to locate disease and bark beetle material has been made one operation and is being conducted on a year round basis. Work in territory where elms are few and widely scattered is not considered feasible under the reduced program. The culturing of beetle material as a means of early detection of the Dutch elm disease fungus in an area is being given about the same attention as culturing specimens from symptomatic trees. To make the removal work which can be done as effective as possible in reducing the disease-insect conditions, only the most dangerous material is destroyed. Some diseased trees that are not a menace and can be pruned more economically than they can be removed, are left standing. Periodic scouting in the so-called inactive areas and special survey areas is considered more practical than working such areas each year.

Up to November 14, 1942, a total of 65,151 elms have been found infected in ten states. Nearly 6,000,000 elm trees have been removed as hazardous because of the presence of bark beetle carriers or for reasons other than being known victims of the disease. In addition, more than 300,000 elms have been pruned to remove beetle-infested material. Approximately 125,000 square miles have been scouted to locate such disease and insect material. As of June 30, 1942, approximately $24,000,000 of state and federal funds had been expended in the fight against the disease. Allotments of emergency money made up about eighty per cent of this total.

FOREST INDUSTRIES PUBLISH SECOND BOOK ON FORESTS FOR SCHOOL USE



Trees for Tomorrow, second educational book on the forests, published by the American Forest Products Industries, Inc., is ready for free distribution to schools.

Like its predecessor, *America's Forests*, the new book is geared to the seventh, eighth, and ninth grades. The first book discussed the past and present of America's most abundant natural resources. *Trees for Tomorrow* emphasizes the measures being taken by the forest industries to perpetuate the forest harvest on a sustained yield basis.

Trees for Tomorrow will be supplied to all teachers and schools requesting it in sufficient quantity for all members of their classes.

Write to:

AMERICAN FOREST PRODUCTS INDUSTRIES, INC.

1319 Eighteenth St., N. W., Washington, D.C.

Save-the-Redwoods

Send 10 cents each for these attractively illustrated pamphlets: "A Living Link in History," by John C. Merriam ... "Trees, Shrubs and Flowers of the Redwood Region," by Willis L. Jepson ... "The Story Told by a Fallen Redwood," by Emanuel Fritz ... "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send $2 for annual membership (or $10 for contributing membership).

SAVE-THE-REDWOODS LEAGUE
250 Administration Building,
University of California, Berkeley, Calif.

Conservation in Congress

(*Continued from page* 88)

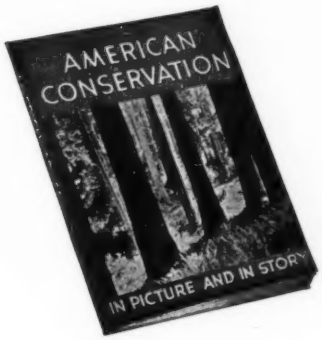
The item for national forest acquisition was reduced $254,200 to $100,000. The cooperative farm forestry item is estimated at $696,170, as compared with $700,000 in the current year. Of the total amount, the extension service will receive $106,840, the Forest Service $461,780, and the Soil Conservation Service $127,550.

While the Soil Conservation Service item was reduced $384,212 to a $22,042,990 total, no appropriation was considered necessary for the activities of Tennessee Valley Authority. The explanatory statement of the General Public Works program contains the following statement in this respect: "The Authority is financed by congressional appropriations and by revenues from the sale of power and fertilizer. Its program has been revised to conform to the nation-wide policy of conserving to the utmost the material, equipment, and manpower resources of the nation. It is confining its construction activities to those projects immediately essential to the war. As a result of the curtailment no new appropriation is required for 1944."

While the Department of the Interior estimates are considered to be "cut to the bone," many of the forestry and conservation items of the Department received substantial increases. The Fish and Wild Life Service item was reduced $159,200 to a $5,752,365 total, but the estimate for the Grazing Service was increased $118,200 to a $978,000 total. The item for operation of the National Park Service was reduced $53,020 to a $4,793,000 total, but administration and maintenance of O & C lands was increased $41,250 to a $290,000 total. The latter increase was necessary to meet costs of "increased timber sales for military needs and to provide more adequate fire protection for these lands."

The soil and moisture conservation item is estimated at $1,300,000 for the 1944 fiscal year, a reduction of $40,000. The item for prevention of forest fires in Alaska was increased $2,350 to a $30,000 total. Forestry and conservation received substantial increases in the Bureau of Indian Affairs as follows: general administration increased $43,090 to a $425,000 total; timber sales increased $19,330 to $145,000; and suppression of forest fires remains the same as the current year appropriation of $15,000. No estimate is contained in the budget for maintenance and construction of National Park Service roads and trails or the Blue Ridge. Natchez Trace and George Washington Memorial Parkways.

$2.50



$2.50

Read what one reviewer—Edward Anderberg, Jr., of Club Dial—has to say about these two books.

KNOWING YOUR TREES, *by* G. H. COLLINGWOOD.

Do you know your trees? If you don't, don't you think you should, and don't you wish you did? You can learn to know not only their general form and characteristics, but also many of the more intimate details of their private lives in this enlarged and revised book.

This volume is not a popularized version of a scientific subject. It is not, because it contains practically all of the salient details which anyone—even a trained botanist—might wish it to have. This volume serves a need by striking a mean. It serves a need because it helps one gain that knowledge of trees and their characteristics which is the aim or desire of so many persons, young and old, today. It strikes a mean because it cautiously tempers the botanist's technical terms and descriptions with a consideration for the layman's requirements of a simpler, clearer and more attractive presentation. Here one finds an amazing amount of detail packed within the two pages allotted to each species of tree.

One can easily discover for each tree included a description of the physical qualities and the nature of a tree, usually in both winter and summer the real key to its identification; a statement on the type of soil and environment it prefers, and a map showing the geographical region in which the tree has its *natural* habitat; an outline of the particular qualities of the tree which make it of economic importance; a statement of the diseases common to the tree and their characteristics; and any other particularly important and specific data which may be pertinent. If scientific names disturb you, there is a very helpful translation and explanation of each one.

A book review, if it does nothing else, should tell a reader whether the volume in question is worth owning or just worth reading. This one is worth owning, permanently.

AMERICAN CONSERVATION, *by* OVID BUTLER, compiler and editor, with 254 illustrations.

"No other job has ever been better done than the development of the American continent by the American people. Their toil and sweat and brains are what have made this the greatest country on earth." This quotation is all too familiar in our history texts. It is easily said and believed. Yet, if the same American people had landed on the coasts of a new Norway or a new Greece, rather than on the coasts of the New World, would they have created "the greatest country on earth?" The answer is no, and serves to deaden such praise of the American people.

What is it that gave this country its rapid growth and tremendous wealth? It is the physical site—the land. It is what exists under, on and above the surface of the earth. It is the organic natural resources. America's riches were here before we came, and we have merely used them. We have mined not only our coal, but our soil as well. We have cropped not only our corn, but our forest resources. Finally the land has cried out and man has been forced to recognize its vital place in permanent production. We are just beginning to learn the value of saving the land. This is the beginning of American conservation.

The only way the people can be made to start conserving our natural resources is to educate them into it. This volume represents one of the many necessary attempts—through clever word and striking, often tragic, pictures—to do just that. It shows us the time required to create our corn belt and great plains soils, our giant Fir and Sequoia—in short the wealth that is America. It shows us with what rapid pace this master work of time can be destroyed by man—or saved, if he will only use it as he should—conservatively. This book shows how we can and are beginning to conserve what is our priceless heritage—our land.

Order from

THE AMERICAN FORESTRY ASSOCIATION

919 - 17TH ST., N. W. WASHINGTON, D. C.

OUR MEN NEED BOOKS

SEND ALL YOU CAN SPARE

That book you've enjoyed — pass it along to a man in the service. Help the man in uniform enjoy his leisure hours.

Good books, in good condition are wanted by the 1943 VICTORY BOOK CAMPAIGN for men in all branches of the Service.

Good books are needed from your bookshelves. Get them out — leave them at the nearest collection center or public library.

Ties for Total War

(*Continued from page* 69)

a shoestring. Generally the owners who until recently worked at another tie mill or for one of the larger logging companies, are only interested in selling enough ties to meet their payrolls every week and payments on equipment and timber. Consequently, many are inadequately set up and as a result break down frequently. In contrast to this, one of the better operators with adequate financial backing built a very efficient mill, which was complete to the last detail before a tie was cut. This operator also saw to it that as much lumber as possible was cut from the slabs or sides of the logs and any material which could not be used for lumber was cut into sixteen-inch stove wood.

But large or small, efficient or not, each of these mills is performing a job vital to the successful prosecution of the war. Ties by the thousands are needed to maintain and extend wartime transportation, at home and abroad, wherever Americans and their allies are fighting. Morton, with its motley group of tie mills scattered over the surrounding countryside, is making a determined effort toward supplying this need.

Blue Grouse

(*Continued from page* 59)

weather may find them moving around again. Like the ruffed grouse, the blue develops comb-like scales along each side of the toes as snowshoes for winter travel.

As the birds go down the mountain in the spring to the valleys, foothills and lower slopes, they change their food preferences. Leaves, berries and insects are taken, though they never give up their needles entirely. Even in summer when they feed upon a wide variety of foods, they still take needles in some quantity. Berries such as currant, amelanchier, snowberry, hawthorn and blueberry supply both food and moisture.

In the fall, grouse frequently feed on larch and lodgepole ridges where wise hunters go for them. Some birds stay at the top of the mountains all summer. Studies indicate that these are males of the preceding year's brood, which, though mature, apparently may not breed during the first year of life. This peculiarity of the young males at high altitudes has given rise to a belief among rangers, woodsmen and others that there are two kinds of blue grouse—big ones on the mountains and small ones in the valleys. The small ones are the more frequently seen; yet instead of being a different species, they are females only two-thirds the size of the males.

WHO'S WHO

Among the Authors in this Issue

CHARLES ELLIOTT (*The Black Warrior Goes to War*), native Georgian, is a well-known forester and conservationist. Writing is almost his first love, though he has been active in both national and state forest work for several years. Here he tells how a great national forest of the South has gone into Uncle Sam's Army.

MAUNSELL VAN RENNSELAER (*The Santa Lucia Fir*) is director of Santa Barbara's Botanic Garden. This fascinating account of a visit to the home of the Santa Lucia firs is as told by him to McDonald White, free-lance writer and native Californian, who lives at Laguna Beach.

LEONARD WING (*Blue Grouse*) is assistant professor of wildlife management at the State College of Washington, at Pullman. A Yale forester, he majored in zoology at the University of Wisconsin and is one of the few trained wildlife managers in the country.

SIGMUND SAMETH (*From Indigo to Ducks*) is a professional anthropologist specializing in American Indian material, and a writer and archeologist as well.

FRANK HENIUS (*Oils from the Amazon*) is keen on the tremendous possibilities of the development of trade with Latin America. His attention has recently been centered on a study of the vegetable oils of Latin America, with a view to the needs of our home markets,—depleted through the loss of our regular imports from the Far East, now cut off by war.

E. G. BREWER (*The Elms and the War*) has been identified with plant pest control work for more than thirty years. He has, since 1937, headed up regulatory, eradication and control work on the Dutch Elm disease for the Government.

GORDON D. MARCKWORTH (*Ties For Total War*), a native of Ohio, studied forestry at Ohio State and took his Master's degree from Yale in 1917. He has had an active career, teaching forestry and in administrative work in the southern states. He is now on the faculty of the University of Washington, at Seattle, as professor of game management.

HARRY STANTON TILLOTSON (*John Bartram and His Trees*), a native New Yorker, is an artist as well as writer. A long interest in plant life has led to many interesting experiments, about which he has written a great deal.

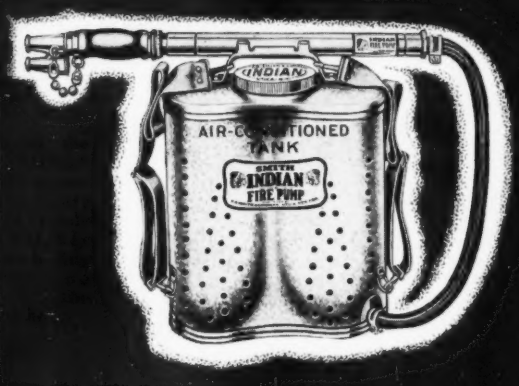
THE COVER — Photograph by John Kabel. "Snow Shadows in Ohio Woods."

Fire Pumps

Save the Timberlands So Vital to Victory!

U. S. Dept. of Agriculture estimates five full-grown trees are needed to back up every soldier. One builds cantonments, mess halls, living quarters. Second provides wooden crates needed to ship food, clothing, armament, ammunition. The remaining three go into the making of practically every piece of equipment used in modern war.

Each forest fire seriously retards the Victory program. **INDIAN FIRE PUMPS** are the fastest, surest way to stop fires before they spread. Clear water under pressure drives to the base of the flame, killing it instantly — completely.



EVERY FIRE AIDS THE ENEMY

Plywood for airplane construction, wood cellulose for high explosives, wood in bombers and battleships and lumber in pontoon bridges are only a few of the demands for timber. Uncle Sam expects every citizen to prevent forest fires — and be prepared to **PUT THEM OUT QUICKLY** when they start.

Indian Fire Pumps will do it.

D. B. SMITH & CO. 405 Main St., UTICA, N. Y.

PACIFIC COAST BRANCH: HERCULES EQUIPMENT & RUBBER CO. 435 BRANNAN ST. SAN FRANCISCO, CAL.

TREES MARCH TO WAR, TOO....

Millions of forest giants (5 entire trees for each man in the armed services) provide lumber for war purposes. Millions of other trees provide nuts and fruit to swell the nation's food supply. We are spending trees faster than we grow them—and there is no public money to spare for million-acre plantings just now. But you—and a million like you—can plant a million acres if each does his part. You will find much more satisfaction and pleasure if your spring planting is a real part of the war effort. Here are some practical suggestions:

NATURAL RESOURCES

An empty acre adds nothing to the country's resources—one planted in trees adds $15 per year (average) and stops erosion, too. Every little bit helps.

100 Transplanted Evergreens

Well-rooted babies, small but vigorous. 3 years old. 25 each of four kinds: Scotch Pine, Norway Spruce, Arborvitae and Douglas Fir, prepaid (East of Miss.) $6.

100 Young Deciduous Trees

Sturdy 12 to 18 in. seedlings to make valuable and beautiful shade trees. 25 each, four kinds:

Sugar Maple (sugar) — Liriodendron (Whitewood)
Black Locust (posts) — White Ash (handles)
Prepaid (East of Miss.) $4.

LABOR-SAVERS

Some garden plants are much less labor than others—conserve your energy and pocketbook.

37 Feet of Yew Hedge

Set 18 inches apart, 25 Upright Hardy Yew will make a 37-foot insect-free hedge that takes care of itself. Plants now 12 to 15 inches high, twice transplanted, sturdy, bushy. (Express, not prepaid) $12.50.

20 Assorted Rhododendrons

Beauty without cultivation; free of all usual pests! Plants now 1 ft. high, with small earth ball. Small, but vigorous. 5 each of following kinds:

Rhododendron maximum (white, July)
Rhododendron carolina (pink, May)
Rhododendron catawbiense (red, June)
Kalmia (Mountain Laurel) (pink, June)
(Express, not prepaid) $10.

FOOD PRODUCERS

Trees and shrubs are long-lived, require no yearly plowing and sowing. Add your bit to the country's food basket.

10 New Giant Blueberries

Strong 4-year olds (bearing age) now 1½ feet high. Assorted named varieties, our selection, but all good. Express, not prepaid, $12.

5 Dwarf Fruit Trees

A complete home orchard for the really small place. Dwarf fruits are spaced only 10 feet apart—2 year olds to bear next year—no ladders for spraying and picking—large fruit.

Red Astrakhan Apple (summer)
McIntosh Apple (autumn)
Duchess d' Angouleme Pear
Italian Prune Plum
Elberta Peach

Not prepaid: $15 (Or 1-year olds—all 5 for $10).

5 Blight-Resistant Chestnuts

Good old-fashioned sweet chestnuts on a blight-free tree! Bear young—some of the 3-ft. trees offered have borne in nursery. Express, not prepaid. $6.50.

CHEMICAL SAVERS

Attract the birds to eat your insects—conserve chemical sprays.

3 Showy Berry-Trees

Handsome blooms in spring, then a show of bright berries in fall that the birds love. One each, 4 to 5 foot, transplanted—

Mountain Ash
White Flowering Dogwood
Paul's Scarlet Hawthorn
} Express, not prepaid—$5.

SENSIBLE WAR GARDENS is the title of a short article in our 1943 Short Guide which more fully discusses this idea and gives lists and hints from which to plan. The guide itself prices and describes 1200 plants. We think we can offer BETTER plants CHEAPER than others, by reason of mass production, improved growing methods, new and exclusive strains and varieties. The book is free except West of Iowa, where we charge 25 cents.

KELSEY NURSERY SERVICE

Office: 50B Church Street, New York, N. Y. (Established 1878)

TREES MARCH TO WAR, TOO....

Millions of forest giants (5 entire trees for each man in the armed services) provide lumber for war purposes. Millions of other trees provide nuts and fruit to swell the nation's food supply. We are spending trees faster than we grow them—and there is no public money to spare for million-acre plantings just now. But you—and a million like you—can plant a million acres if each does his part. You will find much more satisfaction and pleasure if your spring planting is a real part of the war effort. Here are some practical suggestions:

NATURAL RESOURCES

An empty acre adds nothing to the country's resources—one planted in trees adds $15 per year (average) and stops erosion, too. Every little bit helps.

100 Transplanted Evergreens

Well-rooted babies, small but vigorous. 3 years old. 25 each of four kinds: Scotch Pine, Norway Spruce, Arborvitae and Douglas Fir, prepaid (East of Miss.) $6.

100 Young Deciduous Trees

Sturdy 12 to 18 in. seedlings to make valuable and beautiful shade trees. 25 each, four kinds:

Sugar Maple (sugar) Liriodendron (Whitewood)
Black Locust (posts) White Ash (handles)
Prepaid (East of Miss.) $4.

LABOR-SAVERS

Some garden plants are much less labor than others—conserve your energy and pocketbook.

37 Feet of Yew Hedge

Set 18 inches apart, 25 Upright Hardy Yew will make a 37-foot insect-free hedge that takes care of itself. Plants now 12 to 15 inches high, twice transplanted, sturdy, bushy. (Express, not prepaid) $12.50.

20 Assorted Rhododendrons

Beauty without cultivation; free of all usual pests! Plants now 1 ft. high, with small earth ball. Small, but vigorous. 5 each of following kinds:

Rhododendron maximum (white, July)
Rhododendron carolina (pink, May)
Rhododendron catawbiense (red, June)
Kalmia (Mountain Laurel) (pink, June)
(Express, not prepaid) $10.

FOOD PRODUCERS

Trees and shrubs are long-lived, require no yearly plowing and sowing. Add your bit to the country's food basket.

10 New Giant Blueberries

Strong 4-year olds (bearing age) now 1½ feet high. Assorted named varieties, our selection, but all good. Express, not prepaid, $12.

5 Dwarf Fruit Trees

A complete home orchard for the really small place. Dwarf fruits are spaced only 10 feet apart—2 year olds to bear next year—no ladders for spraying and picking—large fruit.

Red Astrakhan Apple (summer)
McIntosh Apple (autumn)
Duchess d' Angouleme Pear
Italian Prune Plum
Elberta Peach

Not prepaid: $15 (Or 1-year olds—all 5 for $10).

5 Blight-Resistant Chestnuts

Good old-fashioned sweet chestnuts on a blight-free tree! Bear young—some of the 3-ft. trees offered have borne in nursery. Express, not prepaid. $6.50.

CHEMICAL SAVERS

Attract the birds to eat your insects—conserve chemical sprays.

3 Showy Berry-Trees

Handsome blooms in spring, then a show of bright berries in fall that the birds love. One each, 4 to 5 foot, transplanted—

Mountain Ash
White Flowering Dogwood
Paul's Scarlet Hawthorn

} Express, not prepaid—$5.

SENSIBLE WAR GARDENS is the title of a short article in our 1943 Short Guide which more fully discusses this idea and gives lists and hints from which to plan. The guide itself prices and describes 1200 plants. We think we can offer BETTER plants CHEAPER than others, by reason of mass production, improved growing methods, new and exclusive strains and varieties. The book is free except West of Iowa, where we charge 25 cents.

KELSEY NURSERY SERVICE

Office: 50B Church Street, New York, N. Y. (Established 1878)